Message

Sent: 10/12/2018 6:26:13 PM
To: Pina, Yvette [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9798b66f4ff443cd817b050f17d17215-YPina]
CC: Reshkin, Karen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=17e2474bb6994d12aa2d825d1e350ca2-KReshkin]
Subject: RE: Updates to Sterigenics home page and new FAQ page

Somehow, every single

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: 919.321.7652

From: Pina, Yvette
Sent: Friday, October 12, 2018 1:05 PM
To: Bremer, Kristen <Bremer.Kristen@epa.gov>
Cc: Reshkin, Karen <Reshkin.Karen@epa.gov>
Subject: RE: Updates to Sterigenics home page and new FAQ page

Yes, I posted the content from the Word document you sent yesterday and removed all the old FAQ content.

From: Bremer, Kristen
Sent: Friday, October 12, 2018 12:01 PM
To: Pina, Yvette <pina.yvette@epa.gov>
Cc: Reshkin, Karen <Reshkin.Karen@epa.gov>
Subject: RE: Updates to Sterigenics home page and new FAQ page

I only noticed the first question, which was incorrect, so I replaced that one. However, it might be best to just unpublish what's there and republish the page with the text I sent you yesterday.

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: 919.321.7652

From: Pina, Yvette
Sent: Friday, October 12, 2018 11:37 AM
To: Bremer, Kristen <Bremer.Kristen@epa.gov>
Cc: Reshkin, Karen <Reshkin.Karen@epa.gov>
Subject: RE: Updates to Sterigenics home page and new FAQ page

I published the wrong FAQ page.

We had made one weeks ago and I got mixed it with that and the new one.

Do you want it published or unpublished?

From: Bremer, Kristen
Sent: Thursday, October 11, 2018 3:55 PM
To: Pina, Yvette <pina.yvette@epa.gov>
Cc: Reshkin, Karen <Reshkin.Karen@epa.gov>
Subject: Updates to Sterigenics home page and new FAQ page
Importance: High

Hi Yvette,

Based on requests from our folks, I added a new box to the home page (in the right panel). They wanted a link to the latest updates and also a link to FAQs…which would be a new page. I thought I had the ability to create new content, but I don't see that option. Therefore, would you be able to create a new Frequent Questions page tonight? I've attached the content to this email. Once the page is created, could you then add the link(s) from the home page?

Sorry for the last-minute request. We're all working from home on account of the hurricane so it's been a day of conference calls, phone tag and reallllllly long email chains.

Thanks!

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: 919.321.7652

Message

Sent: 10/12/2018 2:06:25 PM
To: Pina, Yvette [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9798b66f4ff443cd817b050f17d17215-YPina]
CC: Reshkin, Karen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=17e2474bb6994d12aa2d825d1e350ca2-KReshkin]
Subject: RE: Updates to Sterigenics home page and new FAQ page

Our folks asked for something more prominent on the front page. Can you take a look at the addition I made to the right panel?

https://wcms.epa.gov/node/206731/revisions/729341

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: 919.321.7652

From: Pina, Yvette
Sent: Friday, October 12, 2018 9:48 AM
To: Bremer, Kristen <Bremer.Kristen@epa.gov>
Cc: Reshkin, Karen <Reshkin.Karen@epa.gov>
Subject: RE: Updates to Sterigenics home page and new FAQ page

I made the Frequent Questions page and added the link under What We Know.
https://www.epa.gov/il/sterigenics-willowbrook-facility-frequent-questions

Yvette
312-353-8439

From: Bremer, Kristen
Sent: Thursday, October 11, 2018 3:55 PM
To: Pina, Yvette <pina.yvette@epa.gov>
Cc: Reshkin, Karen <Reshkin.Karen@epa.gov>
Subject: Updates to Sterigenics home page and new FAQ page
Importance: High

Hi Yvette,

Based on requests from our folks, I added a new box to the home page (in the right panel). They wanted a link to the latest updates and also a link to FAQs…which would be a new page. I thought I had the ability to create new content, but I don't see that option. Therefore, would you be able to create a new Frequent Questions page tonight? I've attached the content to this email. Once the page is created, could you then add the link(s) from the home page?

Sorry for the last-minute request. We're all working from home on account of the hurricane so it's been a day of conference calls, phone tag and reallllllly long email chains.

Thanks!

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: 919.321.7652

Message

Sent: 8/23/2018 5:43:42 PM
To: Deamer, Eileen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f2d19c60656344f5b14361c0acc826d2-EDeamer]
CC: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Bassler, Rachel [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=6dfb9f45b1e3443e95fe97296e7a8467-Bassler, Rachel]; Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: RE: Connecting Eileen and Alison

I spoke with Alison and confirmed that Region 5 will be po

_____
Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: 919.321.7652

-----Original Message-----
From: Deamer, Eileen
Sent: Thursday, August 23, 2018 12:12 PM
To: Bremer, Kristen <Bremer.Kristen@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Bassler, Rachel <Bassler.Rachel@epa.gov>
Subject: RE: Connecting Eileen and Alison

Oh girl - you are way behind in the conversation. Give me a call.

Eileen Deamer
U.S. EPA Region 5
Congressional and Intergovernmental
(312) 886-1728

-----Original Message-----
From: Bremer, Kristen
Sent: Thursday, August 23, 2018 10:59 AM
To: Deamer, Eileen <deamer.eileen@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Bassler, Rachel <Bassler.Rachel@epa.gov>
Subject: RE: Connecting Eileen and Alison

Eileen!

Personal Matters / Ex. 6

So all things Sterigenics (data, ATSDR letter, etc.) will be kept on a site/page maintained by Region 5. We would then link to that information from our Ethylene Oxide site at: https://www.epa.gov/hazardous-air-pollutants-ethylene-oxide

I'm not sure who in the region will maintain the Sterigenics page. I received draft text from Josh Singer for the old Sterigenics site (that they took down yesterday) but I'm not sure if he's the right contact.

Feel free to call me if this doesn't make sense.

_____
Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: 919.321.7652

-----Original Message-----
From: Deamer, Eileen
Sent: Thursday, August 23, 2018 11:37 AM
To: Bremer, Kristen <Bremer.Kristen@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Bassler, Rachel <Bassler.Rachel@epa.gov>

Subject: RE: Connecting Eileen and Alison

Kristen - Also once we have it, I need the link to the Sterigenics samples as we are including it in a note to Willowbrook employees.

Thanks ☺

Eileen Deamer
U.S. EPA Region 5
Congressional and Intergovernmental
(312) 886-1728

-----Original Message-----
From: Deamer, Eileen
Sent: Thursday, August 23, 2018 10:22 AM
To: Bremer, Kristen <Bremer.Kristen@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Bassler, Rachel <Bassler.Rachel@epa.gov>
Subject: FW: Connecting Eileen and Alison

Hey Buddy!
Long time no talk. Here is what we need posted/linked. I'm including Katie, branch chief in Air Division, Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thanks!

Eileen Deamer
U.S. EPA Region 5
Congressional and Intergovernmental
(312) 886-1728

-----Original Message-----
From: Deamer, Eileen
Sent: Thursday, August 23, 2018 10:03 AM
To: Davis, Alison <Davis.Alison@epa.gov>
Cc: Reshkin, Karen <Reshkin.Karen@epa.gov>
Subject: RE: Connecting Eileen and Alison

Alison - what do you need from us specifically? See attached.

Eileen Deamer
U.S. EPA Region 5
Congressional and Intergovernmental
(312) 886-1728

-----Original Message-----
From: Grantham, Nancy
Sent: Thursday, August 23, 2018 9:54 AM
To: Deamer, Eileen <deamer.eileen@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>
Cc: Grantham, Nancy <Grantham.Nancy@epa.gov>
Subject: Connecting Eileen and Alison

To get the willowbrook sterigenics data linked to from the national nata data links -

Deliberative Process / Ex. 5

Thx ng

Sent from my iPhone

Message

From: Lewis, Josh [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=B22D1D3BB3F84436A524F76AB6C79D7E-JOLEWIS]
Sent: 10/18/2018 8:49:37 PM
To: Bremer, Kristen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b7ad6f4a11064ef08cb03aec9dc8e892-KBREMER]
CC: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: Re: Sterigenics Willowbrook concerns

Thanks

On Oct 18, 2018, at 4:48 PM, Bremer, Kristen <Bremer.Kristen@epa.gov> wrote:

> We're actually working on that language now. I'll send you the approved statement(s) once we have them.
>
> _____
> Kristen Bremer
> Policy Analysis & Communications
> U.S. EPA, Office of Air Quality Planning & Standards
> Email: bremer.kristen@epa.gov
> Phone: 919.541.9424
> Cell: 919.321.7652
>
> **From:** Lewis, Josh
> **Sent:** Thursday, October 18, 2018 4:46 PM
> **To:** Bremer, Kristen <Bremer.Kristen@epa.gov>
> **Subject:** Re: Sterigenics Willowbrook concerns
>
> Thanks. Do you have a couple of standard talking points I can use for future calls to our main oar line? Something that addresses the upcoming citizen meeting and any general info we're saying?
>
> On Oct 18, 2018, at 4:20 PM, Bremer, Kristen <Bremer.Kristen@epa.gov> wrote:
>
>> Thanks, Josh. These have been added to the tracker.
>>
>> _____
>> Kristen Bremer
>> Policy Analysis & Communications
>> U.S. EPA, Office of Air Quality Planning & Standards
>> Email: bremer.kristen@epa.gov
>> Phone: 919.541.9424
>> Cell: 919.321.7652
>>
>> **From:** Lewis, Josh
>> **Sent:** Thursday, October 18, 2018 12:49 PM
>> **To:** Bremer, Kristen <Bremer.Kristen@epa.gov>
>> **Subject:** FW: Sterigenics Willowbrook concerns
>>
>> Email 2 of 2.

From: Janine Lichtenberger [mailto:[redacted]@hotmail.com]
Sent: Tuesday, October 16, 2018 3:21 PM
To: Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Wheeler, Andrew <wheeler.andrew@epa.gov>; stepp.cathy@epa.com
Subject: Sterigenics Willowbrook concerns

Dear Josh Lewis,

I am contacting you regarding the Sterigenics plant in Willowbrook, IL that continues to operate and release ethylene oxide (a class 1 carcinogenics) into a densely populated area with several schools, daycares and residential homes that are within a 1 mile circle of the facility. The letter issued by the Department of Health & Human Services (Agency for Toxic Substances and Disease Registry, Region 5) on July 26, 2018 evaluating the cancer risk of the area surrounding the Sterigenics facility in Willowbrook, IL is attached. The ATSDR concludes that "if measured and modeled data represent typical EtO ambient concentrations in ambient air, an elevated cancer risk exists for residents and off-site workers in the Willowbrook community surrounding the Sterigenics facility. These elevated risks present a public health hazard to these populations."

As a concerned resident of Burr Ridge, I am requesting you take immediate action to advocate for the affected citizens of Willowbrook/ Burr Ridge. I am aware that the company installed additional pollution control (scrubbers on the back vents) in July 2018 and performed a stack test in September 2018. Unfortunately, the (attached) preliminary report released by Sterigenics showed only concentrations, but no total annual releases, and hence the data in there cannot be used to model the total cancer risk. (I.e. it only shows the density of EtO as a fraction of the total gas emitted, but since we don't know the value of the total gas emitted, we cannot calculate the total release rates of EtO). The company committed to releasing a complete report "soon" (verbatim from the attached letter) (or at least within 2 weeks or so from the date of the release of the preliminary report). This data was supposed to be utilized by the US EPA to conduct another modeling study to re-evaluate the cancer risk in the area. Can you provide any update on this task?

In the meantime, why does US EPA not temporarily shut down this facility until the risk has been properly evaluated? Why I understand that some medical equipment does require EO sterilization, and alternative processes such as gamma rays or hydrogen peroxide sterilization are not suitable for medical product, there is absolutely NO reason to have such a facility in a highly populated area. Please also keep in mind that EO is dangerous at ambient concentrations BELOW the current detection limit, hence further ambient air sampling is not beneficial. It's the long term exposure that causes the harm, and some people have been exposed to this chemical for 34 years by now.

Finally, as a chemical engineer myself I did some "back-of-the-envelope" calculations using values from the attached ATSDR letter. Table 4 in this report shows the calculation of the cancer risk assuming an ambient concentration of 2.1 ug/m3 (highest value measured in a residential neighborhood). Now the company installed scrubbers on the back vents and claims a reduction of the emission by 90%. If we now assume this residential concentration is 90% less (~ 0.21 ug/m3)

we can recalculate that cancer risk. With this new concentration the cancer risk is 6.4E-4 for the 33 years of operation. If the company remains operational, people will eventually get the full 78 years lifetime risk of 9.98E-4. Both of these cancer risk values exceed the U.S. EPA's decision-making cancer risk range of 1.0×10^{-6} to 1.0×10^{-4}.

It is time that the EPA takes some action to protect our citizens and in particular our children! Three meetings that were scheduled by the US EPA region 5 to discuss this issue were canceled by Cathy Stepp without much pre-notice and obvious reason.

Thank you for any update and action in advance.

Best Regards

Janine Lichtenberger

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 9/25/2018 9:27:44 PM
To: DeLuca, Isabel [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0b021c30cbee4637a7c7ca683e5e044a-IDELUCA]; Jones, Enesta [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=65b8e6c6e5ca4a7a9ae85d98a4c8eedb-EJones02]; Bremer, Kristen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b7ad6f4a11064ef08cb03aec9dc8e892-KBREMER]
Subject: RE: Illinois lawmakers' request for info on removal of ATSDR report from EPA website/air testing at Sterigenics facility

We'll check. Kristen – do you know?

From: DeLuca, Isabel
Sent: Tuesday, September 25, 2018 5:15 PM
To: Jones, Enesta <Jones.Enesta@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>
Subject: RE: Illinois lawmakers' request for info on removal of ATSDR report from EPA website/air testing at Sterigenics facility

Plus Alison. Alison, do you know if there is a draft response to this letter from Duckworth, Durbin and Foster requesting ambient monitoring around Willowbrook?

Deliberative Process / Ex. 5

From: Jones, Enesta
Sent: Tuesday, September 25, 2018 5:05 PM
To: Bremer, Kristen <Bremer.Kristen@epa.gov>; DeLuca, Isabel <DeLuca.Isabel@epa.gov>
Subject: Fwd: Illinois lawmakers' request for info on removal of ATSDR report from EPA website/air testing at Sterigenics facility

Deliberative Process / Ex. 5

Begin forwarded message:

Resent-From: <Press@epa.gov>
From: Sean Reilly <sreilly@eenews.net>
Date: September 25, 2018 at 5:04:19 PM EDT
To: Press <Press@epa.gov>
Subject: Illinois lawmakers' request for info on removal of ATSDR report from EPA website/air testing at Sterigenics facility

Hi folks:

Let me know if you have any comment on those two requests, as reflected in this letter: https://tinyurl.com/y7hkqm4b. Deadline is 8 p.m.; I'm also checking with Region 5.

Thanks,
Sean

Sean Reilly
Reporter
E&E News
202-446-0433 (Desk)
202-316-4596 (Cell)
sreilly@eenews.net
Twitter: @SeanatGreenwire

E&E NEWS
122 C Street, NW, Suite 722, Washington, DC 20001
www.eenews.net • www.eenews.tv
EnergyWire, ClimateWire, E&E Daily, Greenwire, E&ENews PM

Message

From: Koerber, Mike [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9C513901D4FD49F9AB101A6F7A7A863E-KOERBER, MIKE]
Sent: 9/20/2018 5:22:07 PM
To: Ashley, Jackie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=01a9a3cadfa14c509d09cdae3498dd43-JASHLEY]; Terry, Sara [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a5f08a9bf1324b05bc02a7dd2ea695e4-STERRY]
CC: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]; Bremer, Kristen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b7ad6f4a11064ef08cb03aec9dc8e892-KBREMER]
Subject: FW: Draft email for Elected Officials Meeting on Sterigenics

+ Sara and Jackie

From: Koerber, Mike
Sent: Thursday, September 20, 2018 12:19 PM
To: Rimer, Kelly <Rimer.Kelly@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>
Cc: Sasser, Erika <Sasser.Erika@epa.gov>
Subject: FW: Draft email for Elected Officials Meeting on Sterigenics

fyi

From: Woods, Clint
Sent: Thursday, September 20, 2018 11:46 AM
To: Thiede, Kurt <thiede.kurt@epa.gov>
Cc: Koerber, Mike <Koerber.Mike@epa.gov>
Subject: Re: Draft email for Elected Officials Meeting on Sterigenics

Don't see any issues from my end

On Sep 20, 2018, at 11:23 AM, Thiede, Kurt <thiede.kurt@epa.gov> wrote:

> Clint,
>
> Everything look ok before I proceed?
>
> Kurt Thiede
> Chief of Staff
> EPA Region 5
>
> Sent from my iPhone...please excuse my typos.
>
> Begin forwarded message:
>
> > **From:** "Deamer, Eileen" <deamer.eileen@epa.gov>
> > **Date:** September 20, 2018 at 10:17:00 AM CDT
> > **To:** "Thiede, Kurt" <thiede.kurt@epa.gov>
> > **Cc:** "Kelley, Jeff" <kelley.jeff@epa.gov>, "Nam, Ed" <nam.ed@epa.gov>
> > **Subject: RE: Draft email for Elected Officials Meeting on Sterigenics**

I'm ready to go when you are Kurt. (Rep. Lipinski's staff not included.)

clarisol_duque@durbin.senate.gov; jasmine_hunt@durbin.senate.gov; Tran_Nguyen@durbin.senate.gov; david_applegate@duckworth.senate.gov; Radha_adhar@duckworth.senate.gov; Hilary.Denk@mail.house.gov; Gary.Timmins@mail.house.gov
Samantha.warren@mail.house.gov; lee.campuzano@mail.house.gov; hannah.chargin@mail.house.gov
jcurran@senatedem.ilga.gov; durkin@ilhousegop.org; ftrilla@willowbrook.il.us; Mickey@MayorMickey.com; dpollock@burr-ridge.gov; alec.messina@illinois.gov; laura.roche@illinois.gov; Julie.Armitage@illinois.gov
lissa@serafin.com; rcipriano@schiffhardin.com

Eileen Deamer
U.S. EPA Region 5
Congressional and Intergovernmental
(312) 886-1728

From: Thiede, Kurt
Sent: Thursday, September 20, 2018 9:58 AM
To: Deamer, Eileen <deamer.eileen@epa.gov>
Cc: Kelley, Jeff <kelley.jeff@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Subject: RE: Draft email for Elected Officials Meeting on Sterigenics

Perhaps Ed can find it?

From: Deamer, Eileen
Sent: Thursday, September 20, 2018 9:57 AM
To: Thiede, Kurt <thiede.kurt@epa.gov>
Cc: Kelley, Jeff <kelley.jeff@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Fortin, Denise <Fortin.Denise@epa.gov>; Beckmann, Ronna Erin <beckmann.ronna@epa.gov>
Subject: RE: Draft email for Elected Officials Meeting on Sterigenics

So I think the only email I'm missing is Renee's.

IL Delegation Elected Officials and Staffers

Senator Durbin

- Clarisol Duque (clarisol_duque@durbin.senate.gov)
- Jasmine Hunt (jasmine_hunt@durbin.senate.gov)
- Tran Nguyen (Tran_Nguyen@durbin.senate.gov)

Senator Duckworth

- David Applegate (david_applegate@duckworth.senate.gov)
- Radha Adhar (Radha_adhar@duckworth.senate.gov)

Representative Foster

- Hilary Denk (Hilary.Denk@mail.house.gov)
- Gary Timmins (Gary.Timmins@mail.house.gov)
- Samantha Warren (Samantha.warren@mail.house.gov)

Representative Roskam

- Lee Campuzano (lee.campuzano@mail.house.gov)
- Hannah Chargin (hannah.chargin@mail.house.gov)

Representative Lipinski

- Joel Creswell (joel.creswell@mail.house.gov)
- Brian Oszakiewski (brian.oszakiewski@mail.house.gov)

State Senator

- John F. Curran, IL Senate District 41 jcurran@senatedem.ilga.gov

State Representative

- Jim Durkin, IL House District 82 durkin@ilhousegop.org

Mayor of Willowbrook

- Frank Trilla ftrilla@willowbrook.il.us

Mayor of Burr Ridge

- Mickey Straub Mickey@MayorMickey.com
- J. Douglas Pollock, Village Administrator dpollock@burr-ridge.gov

IL EPA

Alec Messina alec.messina@illinois.gov
Laura Roche laura.roche@illinois.gov
Julie Armitage Julie.Armitage@illinois.gov

Serafin & Associates

Lissa Druss lissa@serafin.com

Renee Cipriano

Eileen Deamer
U.S. EPA Region 5
Congressional and Intergovernmental
(312) 886-1728

From: Thiede, Kurt
Sent: Wednesday, September 19, 2018 5:11 PM
To: Deamer, Eileen <deamer.eileen@epa.gov>
Cc: Kelley, Jeff <kelley.jeff@epa.gov>
Subject: RE: Draft email for Elected Officials Meeting on Sterigenics

Eileen, can you please help me get this message sent out tomorrow morning? Let's connect before you send it out.

Thanks,
Kurt

Greetings,

I'd like to invite you to a briefing for federal, state and local elected officials on either Thursday morning, September 27 or Friday September 28. We will attempt to pick a time that works for most (please see below). The briefing will include senior representatives from our EPA Headquarters' Offices of Air and Radiation (OAR), and Air Quality Planning and Standards (OAQPS). We would like to discuss ethylene oxide testing and EPAs next steps regarding emissions from Sterigenics.

Invited: Sens. Durbin and Duckworth, Reps. Foster and Roskam, State Sen. Curran, State Rep. Durkin, Mayor Trilla and Mayor Straub,
Illinois EPA

Location: 77 W. Jackson
Chicago, IL
19th Floor

Time: We are requesting a 2 hour time block.

Please RSVP with which date and time works best for you, either:

1) 9:00 am – 11:00 am on Thursday, September 27, or
2) Your preferred availability between 9 am and 2:00 pm on Friday, September 28.

Eileen Deamer
U.S. EPA Region 5
Congressional and Intergovernmental
(312) 886-1728

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 10/1/2018 10:13:00 PM
To: Kelley, Jeff [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e154fa5a5f744c70aa3da58e3f87aabe-JKelley]; Grantham, Nancy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=12a3c2ed7158417fb0bb1b1b72a8cfb0-Grantham, Nancy]
CC: DeLuca, Isabel [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0b021c30cbee4637a7c7ca683e5e044a-IDELUCA]; Bremer, Kristen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b7ad6f4a11064ef08cb03aec9dc8e892-KBREMER]
Subject: RE: ETO R5 latest draft.edits.docx - additional change

Those are all the OAQPS edits. But I just got an email that Ryan Jackson would like letters to be posted.

From: Kelley, Jeff
Sent: Monday, October 01, 2018 6:09 PM
To: Davis, Alison <Davis.Alison@epa.gov>; Grantham, Nancy <Grantham.Nancy@epa.gov>
Cc: DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>
Subject: RE: ETO R5 latest draft.edits.docx - additional change

Is this it from OAQPS? Nancy, who else needs to review before we launch? I've got a web person for another 20 minutes

---

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

From: Davis, Alison
Sent: Monday, October 01, 2018 5:07 PM
To: Kelley, Jeff <kelley.jeff@epa.gov>; Grantham, Nancy <Grantham.Nancy@epa.gov>
Cc: DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>
Subject: RE: ETO R5 latest draft.edits.docx - additional change
Importance: High

Thanks Jeff.
We will get you a review of the FAQs tomorrow. Also, I apparently did not copy over our edits to the "Why EPA is involved" section. Sorry about that. They are pasted below:

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

From: Kelley, Jeff
Sent: Monday, October 01, 2018 5:48 PM
To: Davis, Alison <Davis.Alison@epa.gov>; Grantham, Nancy <Grantham.Nancy@epa.gov>
Cc: DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>
Subject: RE: ETO R5 latest draft.edits.docx

We've made the OAQPS revisions … page is at https://wcms.epa.gov/il/sterigenics-willowbrook-facility

---
Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

From: Davis, Alison
Sent: Monday, October 01, 2018 3:28 PM
To: Kelley, Jeff <kelley.jeff@epa.gov>
Cc: DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>
Subject: ETO R5 latest draft.edits.docx

Jeff, per our discussion. Edits for consistency with national page, updates to some info, reflect recent letters, reflect Friday meeting.
-AD

Alison Davis
Acting Director
Policy Analysis & Communications Staff
US EPA, Office of Air Quality Planning & Standards
Research Triangle Park, NC 27711
Desk: 919-541-7587
Mobile: 919-624-0872

Message

From: Lewis, Josh [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=B22D1D3BB3F84436A524F76AB6C79D7E-JOLEWIS]
Sent: 9/27/2018 3:14:47 PM
To: Hamilton, Sabrina [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=68d3167c798743848aafcdfb73bb74f1-shamiltn]; Carroll, Maria [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=4e868254d9da47e1ab5831814a7ff2fb-Carroll, Ma]
CC: Atkinson, Emily [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=bb2155adef6a44aea9410741f0c01d27-Atkinson, Emily]; Lubetsky, Jonathan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e125d09a658e48119789ccae5712b4a5-JLUBETSK]; Bremer, Kristen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b7ad6f4a11064ef08cb03aec9dc8e892-KBREMER]; Ashley, Jackie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=01a9a3cadfa14c509d09cdae3498dd43-JASHLEY]; Terry, Sara [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a5f08a9bf1324b05bc02a7dd2ea695e4-STERRY]
Subject: Before 12 noon today: Draft response to letters
Attachments: 18.09.21 - Letter re Willowbrook ambient air testing request - EPA Wheel....pdf; ATT00001.htm; EPA Wheeler - EtO Emissions at Sterigenics.pdf; ATT00002.htm; Wheeler9252018.pdf; ATT00003.htm

Importance: High

Bill will be signing letters in response to the attached 3 incomings + Congressman Roskam…likely before noon today. Waiting on a final version of the text of the response, and then we'd send identical responses to the following. Can someone double check these look correct and also fill in the appropriate address/info for the IL Governor:

1. The Honorable Tammy Duckworth
United States Senate
Washington, DC 20510

Dear Senator Duckworth:

2. The Honorable Richard J. Durbin
United States Senate
Washington, DC 20510

Dear Senator Durbin:

3. The Honorable Bill Foster
U.S. House of Representatives
Washington, DC 20515

Dear Congressman Foster:

4. The Honorable Daniel Lipinski
U.S. House of Representatives
Washington, DC 20515

Dear Congressman Lipinski:

5. The Honorable Peter Roskam

U.S. House of Representatives
Washington, DC 20515

Dear Congressman Roskam:

6. The Honorable Bruce Rauner
Governor
Fill in appropriate contact info

Dear Governor Rauner:

(note #6 will have a cc to:
Alec Messina
Director, Illinois Environmental Protection Agency

Message

From: Bremer, Kristen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=B7AD6F4A11064EF08CB03AEC9DC8E892-KBREMER]
Sent: 9/20/2018 3:44:06 PM
To: DeLuca, Isabel [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0b021c30cbee4637a7c7ca683e5e044a-IDELUCA]
Subject: FW: Chicago Tribune: Sterigenics questions. DDL noon CST 9/20

Importance: High

Here are our proposed edits:

Deliberative Process / Ex. 5

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: 919.321.7652

From: Davis, Alison
Sent: Wednesday, September 19, 2018 6:13 PM
To: Bassler, Rachel <Bassler.Rachel@epa.gov>; regionalpress <regionalpress@epa.gov>
Cc: Kelley, Jeff <kelley.jeff@epa.gov>; Rowan, Anne <rowan.anne@epa.gov>; Singer, Joshua <Singer.Joshua@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; DeLuca, Isabel <DeLuca.Isabel@epa.gov>
Subject: RE: Chicago Tribune: Sterigenics questions. DDL noon CST 9/20

Letting you know we've received this and will flag for our folks for review.
Please also copy Kristen Bremer and Isabel Deluca on EtO-related inquiries. We will make sure someone gets back to you.

Thanks.

From: Bassler, Rachel
Sent: Wednesday, September 19, 2018 6:04 PM
To: regionalpress <regionalpress@epa.gov>
Cc: Kelley, Jeff <kelley.jeff@epa.gov>; Rowan, Anne <rowan.anne@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>; Singer, Joshua <Singer.Joshua@epa.gov>
Subject: Chicago Tribune: Sterigenics questions. DDL noon CST 9/20

Michael Hawthorne from the Chicago Tribune has air questions about the Sterigenics facility in Willowbrook, Ill. Below are our proposed responses. Please let us know if you have any edits. Also looped in OAQPS who will also need to review. His deadline is noon CST tomorrow.

Deliberative Process / Ex. 5

Rachel Bassler
Press Officer
U.S. EPA Region 5
bassler.rachel@epa.gov
p: 312-886-7159
c: 312-914-3393

Message

From: Bremer, Kristen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=B7AD6F4A11064EF08CB03AEC9DC8E892-KBREMER]
Sent: 10/11/2018 8:15:24 PM
To: Pina, Yvette [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9798b66f4ff443cd817b050f17d17215-YPina]
CC: Reshkin, Karen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=17e2474bb6994d12aa2d825d1e350ca2-KReshkin]
Subject: RE: Another addition to the Sterigenics website

Perfect. Thanks!

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: 919.321.7652

From: Pina, Yvette
Sent: Thursday, October 11, 2018 3:28 PM
To: Bremer, Kristen <Bremer.Kristen@epa.gov>
Cc: Reshkin, Karen <Reshkin.Karen@epa.gov>
Subject: RE: Another addition to the Sterigenics website

Ok, take a look.

https://www.epa.gov/il/sterigenics-willowbrook-facility

From: Bremer, Kristen
Sent: Thursday, October 11, 2018 2:24 PM
To: Pina, Yvette <pina.yvette@epa.gov>
Subject: RE: Another addition to the Sterigenics website

Thank you!

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: 919.321.7652

From: Pina, Yvette
Sent: Thursday, October 11, 2018 3:24 PM
To: Bremer, Kristen <Bremer.Kristen@epa.gov>
Subject: RE: Another addition to the Sterigenics website

I can do it.

From: Bremer, Kristen
Sent: Thursday, October 11, 2018 2:20 PM
To: Pina, Yvette <pina.yvette@epa.gov>
Subject: RE: Another addition to the Sterigenics website

Hi Yvette,

The new Updates page conflicts with the information listed here: https://www.epa.gov/il/sterigenics-willowbrook-facility-agency-response#next-steps

Are you OK with replacing the "What are the next steps?" link on the home page with "Latest updates" and then linking to the new page? A number of folks in my office couldn't find the link to the update page from the home page...they kept clicking on the What are the next steps? link.

I can do it if you're swamped, just wanted to get your input before making the change.

Thanks!

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: 919.321.7652

From: Pina, Yvette
Sent: Wednesday, October 10, 2018 5:26 PM
To: Reshkin, Karen <Reshkin.Karen@epa.gov>
Cc: Bremer, Kristen <Bremer.Kristen@epa.gov>
Subject: RE: Another addition to the Sterigenics website

A new Latest Update page has been made.

I made a table of contents for the page, for when we add more dates.
https://www.epa.gov/il/sterigenics-willowbrook-facility-latest-update

Yvette

From: Reshkin, Karen
Sent: Wednesday, October 10, 2018 3:58 PM
To: Pina, Yvette <pina.yvette@epa.gov>
Subject: Fwd: Another addition to the Sterigenics website

Yvette, please make a fresh page for Sterigenics updates and put this content there. Please link to it from a prominent place on the homepage, maybe at the end of the intro paragraph in a separate line?

Sent from my iPhone

Begin forwarded message:

> **From:** "Bremer, Kristen" <Bremer.Kristen@epa.gov>
> **Date:** October 10, 2018 at 3:31:56 PM CDT
> **To:** "Kelley, Jeff" <kelley.jeff@epa.gov>, "Reshkin, Karen" <Reshkin.Karen@epa.gov>
> **Subject: Another addition to the Sterigenics website**
>
> The attached is another addition for the website. Again, this was requested by Willowbrook officials. It might make sense to have a separate status page? My guess is that we'll be updating this information on a frequent basis.
>
> Our management wants this posted today. Is that possible?
>
> _____
> Kristen Bremer
> Policy Analysis & Communications
> U.S. EPA, Office of Air Quality Planning & Standards
> Email: bremer.kristen@epa.gov
> Phone: 919.541.9424
> Cell: 919.321.7652

Message

From: Hoffman, Kathy [KHoffman@sterigenics.com]
Sent: 8/28/2018 5:40:30 PM
To: Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Armitage, Julie (Julie.Armitage@Illinois.gov) [Julie.Armitage@Illinois.gov]; Mattison, Kevin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=userff092538]
Subject: Willowbrook Compliance Test
Attachments: ATT00001.txt; BV Test ltr 28AUG2018.pdf; Sterigenics Willowbrook I 8-24-18 Backvent Protocol.pdf; Sterigenics Willowbrook II 8-24-18 Backvent Protocol.pdf

As requested in the construction permit, we submitted the attached test protocol to Illinois-EPA (Daniel Rowell this morning. We can do the testing as early as September 20 and 21st if you are willing to waive the 30 and 60-day review requirements. I have tentatively scheduled our tester for these dates. Let me know if you are agreeable with them.

If we can agree on the dates, maybe we could inform the Village of Willowbrook too.

Regards,
Kathy

Kathleen Hoffman
Senior Vice President - Global Environmental, Health & Safety and Technical Services
Sterigenics, A Sotera Health Company
2015 Spring Road, Suite 650
Oak Brook, IL 60523
Office: 630.928.1758
khoffman@sterigenics.com

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TEST PROTOCOL FOR
AIR POLLUTION SOURCE TESTING
OF AN ETHYLENE OXIDE EMISSION-CONTROL SYSTEM
OPERATED BY STERIGENICS US, LLC.
AT ITS WILLOWBROOK II, ILLINOIS FACILITY

Submitted to:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 North Grand Avenue East
Springfield, Illinois 62794

Submitted by:

STERIGENICS US, LLC.
830 Midway Drive
Willowbrook, Illinois 60521

I.D. Number 043110AAC

Prepared by:

ECSI, INC.
PO Box 1498
San Clemente, California 92674-1498

Prepared on:

August 24, 2018

ECSi

CONTACT SUMMARY

CLIENT

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Manager of Environmental Health and Safety
STERIGENICS US, LLC.
2015 Spring Road, Suite 650
Oak Brook, Illinois 60523

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Mr. Paul Krett
General Manager
STERIGENICS US, LLC.
7775 South Quincy Street
Willowbrook, Illinois 60521

Phone: (630)654-5151
FAX: (630)325-0020
email: pkrett@sterigenics.com

TEST DATE

September 20-21, 2018

REGULATORY AGENCY

Daniel Rowell
Environmental Protection Engineer III
Bureau of Air – Air Permits Section
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Springfield, Illinois 62794-9276

Phone: (217)558-4368
FAX: (217)524-5023
Email: daniel.rowell@illinois.gov

TESTING CONTRACTOR

Daniel P. Kremer
President
ECSi, Inc.
PO Box 1498
San Clemente, California 92674-1498

Phone: (949)400-9145
FAX: (949)281-2169
email: dankremer@ecsi1.com

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ECSi

1.0 INTRODUCTION

ECSi, Inc. proposes to conduct air pollution source testing of the ethylene oxide (EtO) emission control system operated by Sterigenics US, LLC. at their Willowbrook II facility, located at 830 Midway Drive. The device to be tested is the two stage AAT Safe Cell packed tower scrubber/dry bed reactor emission-control system, which is used to control emissions from four sterilizer vacuum pumps, four sterilizer backvents and two aeration rooms. The purpose of the testing program will be to demonstrate compliance with backvent emission control requirements and the conditions established in the Air Quality Permit granted to Sterigenics by the Illinois Environmental Protection Agency (IEPA).

We have specialized exclusively in the performance of ethylene oxide source testing and leak testing since 1992, and are the nationally recognized expert in the field. When the current ethylene oxide emissions regulations were being implemented, we worked closely with the California Air Resources Board (CARB) and USEPA to help develop the currently used testing methodology.

2.0 EQUIPMENT

At Willowbrook I, sterilizer backvent emissions are controlled by:

- One two-stage Advanced Air Technologies Safe Cell emission-control system, comprised of a packed-tower chemical scrubber (SC1), equipped with a packed reaction/interface column, a scrubber fluid recirculation system, and a scrubber fluid reaction/storage tank, and a dry bed reactor/scrubber (SC2), comprised of a bank of solid-bed reaction vessels, connected in parallel, installed downstream of SC1 and upstream of a dedicated blower exhaust system.

3.0 TESTING

EtO source testing will be conducted in accordance with the procedures outlined in USEPA CFR40, Part 63.365, using USEPA Method 18 as specified. EtO emissions monitoring will be conducted simultaneously at the inlet and outlet of the Safe Cell System (the inlet of SC1 and the outlet of SC2) during the entire duration of the backvent phase of one of the four sterilizers. A total of three backvent-phase test runs will be performed.

During the backvent phase, EtO emissions at the inlet and the outlet of the Safe Cell System will be determined using direct source sample injection into a gas chromatograph (GC). All testing will be conducted during normal process load conditions. All backvent testing will be performed with freshly sterilized product in the sterilizer. The testing program will be conducted in accordance with the procedures outlined in the following sections.

4.0 RULE/COMPLIANCE REQUIREMENTS

The EtO gas-sterilization system at the Willowbrook I facility is being tested to demonstrate compliance with EPA requirements, as specified in the IEPA Air Quality Permit. The following requirements must be met:

- The sterilizer backvent phase emissions must be vented to control equipment with an EtO emission-reduction efficiency of at least 99 % by weight.

Testing is required to demonstrate compliance with these requirements. Source testing of the emission-control system is required initially, and may be required periodically thereafter.

5.0 TEST METHOD REFERENCE

5.1 INTRODUCTION

EtO source testing will be conducted in accordance with the procedures outlined in USEPA CFR40, Part 63.365, using USEPA Method 18 as specified. EtO emissions monitoring will be conducted simultaneously at the inlet and outlet of the Safe Cell System during the entire duration of the backvent phase of one of the four sterilizers. A total of three backvent-phase test runs will be performed.

During the backvent phase, EtO emissions at the inlet and the outlet of the Safe Cell System will be determined using direct source sample injection into a gas chromatograph (GC). All testing will be conducted during normal process load conditions. All backvent testing will be performed with freshly sterilized product in the sterilizer. The testing program will be conducted in accordance with the procedures outlined in the following sections.

Operation and documentation of process conditions will be performed by personnel from Sterigenics, Inc. using existing monitoring instruments installed by the manufacturer on the equipment to be tested. In accordance with the procedures established in USEPA CFR40, Part 63, Subpart O, scrubber liquor level will be recorded.

5.2 VOLUMETRIC FLOW MEASUREMENT

Exhaust gas flow at the outlet of SC2 will be determined by 40 CFR 60, Appendix A, Method 2C, using a standard pitot tube and an inclined-oil manometer. Sampling ports will be located in accordance with 40 CFR 60, Appendix A, Method 1. The test ports will be located far enough from any flow disturbances to permit accurate flow measurement.

Temperature measurements will be obtained from a type K thermocouple and thermometer attached to the sampling probe. Exhaust gas composition will be assumed to be >99% ambient air. Water vapor will be negligible and, based on previous test data, a default ambient value of 3 percent will be used for determination of exhaust gas composition and flow calculations.

5.3 CONTROL EFFICIENCY AND MASS EMISSIONS MEASUREMENT

The EtO concentration at the inlet and outlet of the Safe Cell System will be measured simultaneously following the procedures delineated in USEPA CFR40, Part 63.365. During backvent, vented gas will be analyzed by an SRI, Model 8610, portable gas chromatograph (GC), equipped with the following: dual, heated sample loops and injectors; dual columns; and dual detectors. A flame ionization detector (FID) will be used to quantify emissions at the emission-control device inlet, and a photoionization detector (PID) will be used to quantify emissions at the emission-control device outlet.

5.4 SAMPLE TRANSPORT

Source gas will be pumped to the GC at approximately 500-1000 cubic centimeters per minute (cc/min) from the sampling ports through two lengths of Teflon® sample line, each with a nominal volume of approximately 75 cubic centimeters (cc) and an outer diameter of 0.25 inch. At the outlet of SC2 the sampling ports will be located in the exhaust stack.

5.5 GC INJECTION

Source-gas samples will then be injected into the GC which will be equipped with two heated sampling loops, each containing a volume of approximately 2cc and maintained at 100 degrees Celsius (C). Injections will occur at approximately one-minute intervals during the sterilization chamber backvent phase. Helium will be the carrier gas for both FID and PID.

5.6 GC CONDITIONS

The packed columns for the GC will both be operated at 85 degrees C. The columns will be stainless steel, 6 feet long, 0.125 inch outer diameter, packed with 1 percent SP-1000 on 60/80 mesh Carbopack B.

Any unused sample gas will be vented from the GC system back to the inlet of the scrubber.

5.7 CALIBRATION STANDARDS

The FID used at the inlet will be calibrated for part-per-million-by-volume (ppmv)-level analyses using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

The PID used at the outlet will be calibrated for ppmv-level analyses using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

Each of these calibration standards will be in a separate, certified manufacturer's cylinder. Copies of the calibration gas laboratory certificates will be included with the final report.

5.8 SAMPLING DURATION

Backvent EtO measurements will be taken for the entire duration of the backvent phase, which will be 15 minutes. This will encompass a total sampling duration of 15 minutes for each backvent phase test run.

5.9 CONTROL-EFFICIENCY/MASS-EMISSIONS CALCULATIONS

Control efficiency of EtO will be calculated for the backvent phase. Control efficiency will be calculated for each data point which will be produced at each injection interval. The time-weighted-average (TWA) EtO control efficiency will be calculated using these results. Results of the control-efficiency testing will be summarized in the final report.

Mass emissions of EtO will be calculated using the following equation:

MassRate = (VolFlow)(MolWt)(ppmv EtO/10^6)/(MolVol)

Where:

MassRate = EtO mass flow rate, pounds per minute

VolFlow = Corrected volumetric flow rate, standard cubic feet per minute at 68 degrees F

MolWt =	44.05 pounds EtO per pound mole
ppmv EtO =	EtO concentration, parts per million by volume
10^6 =	Conversion factor, ppmv per "cubic foot per cubic foot"
MolVol =	385.32 cubic feet per pound mole at one atmosphere and 68 degrees F

Mass emissions of EtO will be calculated for backvent. The results will be summarized in the final report.

6.0 TEST SCENARIO

Backvent testing will be performed during normal process load conditions, with freshly sterilized product in the sterilizer. Three test runs will be conducted in series to verify the performance of the emission-control system. The testing schedule will be as follows:

- Equipment setup and gas chromatograph calibration.
- Backvent Test Run #1 is performed with freshly sterilized product in one of the four sterilizers. Sampling is performed at the inlet and outlet of the Safe Cell System.
- Backvent Test Run #2 is performed with freshly sterilized product in one of the four sterilizers. Sampling is performed at the inlet and outlet of the Safe Cell System.
- Backvent Test Run #3 is performed with freshly sterilized product in one of the four sterilizers. Sampling is performed at the inlet and outlet of the Safe Cell System.
- Post-calibration check performed and equipment breakdown.

7.0 QA/QC

7.1 FIELD TESTING QUALITY ASSURANCE

At the beginning of the test, the sampling system will be leak checked at a vacuum of 15 inches of mercury. The sampling system will be considered leak free when the flow indicated by the rotameters falls to zero.

At the beginning of the test, a system blank will be analyzed to ensure that the sampling system is free of EtO. Ambient air will be introduced at the end of the heated sampling line and drawn through the sampling system line to the GC for analysis. The resulting chromatogram also will provide a background level for non-EtO components (i.e. ambient air, carbon dioxide, water vapor) which are present in the source gas stream due to the ambient dilution air which is drawn into the emission-control device. This chromatogram, designated AMB, will be included with the calibration data in the final report.

7.2 CALIBRATION PROCEDURES

The GC system will be calibrated at the beginning and conclusion of each day's testing. Using the Peaksimple II analytical software, a point-to-point calibration curve will be constructed for each detector. A gas cylinder of similar composition as the calibration gases, but certified by a separate supplier, will be used to verify calibration gas composition and GC performance.

All calibration gases and support gases used will be of the highest purity and quality available. A copy of the laboratory certification for each calibration gas will be included in the final report.

8.0 FINAL TEST REPORT DESCRIPTION

The test results will be summarized in a written report. This report will be submitted to the IEPA no later than sixty days after the conclusion of the field testing. It will include results for EtO control efficiency of the emission-control device and mass emissions of EtO to the atmosphere from the emission-control device outlet. The report will contain:

- Summary tables with comparisons of the test results to rule limits;
- Copies of all intermediate data tables and calculation worksheets;
- Copies of all GC chromatograms from calibration runs and sample injections; and
- Laboratory calibration certificates for all calibration and audit gases and all applicable measurement instruments such as pitot tubes and thermocouples.

Message

From: Nam, Ed [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A2653F1DDD59470688BA557DD84D9690-NAM, ED]
Sent: 8/24/2018 7:16:51 PM
To: Furey, Eileen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5aaa3a0ee58047d983897c53c1eb283e-EFurey]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: FW: Mike - can you help get Clint's OK? Draft context for R5 info on Web
Attachments: Sterigenics_map_results.pdf

Greatly reduced paragraph, but it will be in.

-Ed

From: Deamer, Eileen
Sent: Friday, August 24, 2018 2:15 PM
To: Thiede, Kurt <thiede.kurt@epa.gov>; Payne, James <payne.james@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Cc: Reshkin, Karen <Reshkin.Karen@epa.gov>
Subject: FW: Mike - can you help get Clint's OK? Draft context for R5 info on Web

All: see below -- we got the go ahead to add the one paragraph blurb.

Karen – Please add to the R5 Willowbrook site **ASAP**:

U.S. EPA is working with Illinois EPA and Sterigenics to reduce emissions of ethylene oxide. In July, the company installed additional pollution controls to capture ethylene oxide emissions. U.S. EPA and Illinois EPA will monitor the effectiveness of the new equipment to determine whether any other actions are needed.

Also, replace the sampling document with the one attached.

Thanks,

Eileen Deamer
U.S. EPA Region 5
Congressional and Intergovernmental
(312) 886-1728

From: Koerber, Mike
Sent: Friday, August 24, 2018 2:03 PM
To: Davis, Alison <Davis.Alison@epa.gov>; Deamer, Eileen <deamer.eileen@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>
Subject: FW: Mike - can you help get Clint's OK? Draft context for R5 info on Web

Good to go. Let me know if you want to talk about developing a Region 6-like page. I ran that idea by Clint this morning and he was supportive.

Mike

From: Woods, Clint
Sent: Friday, August 24, 2018 3:01 PM
To: Koerber, Mike <Koerber.Mike@epa.gov>
Subject: Re: Mike - can you help get Clint's OK? Draft context for R5 info on Web

I'm ok with that - Thanks!

On Aug 24, 2018, at 2:47 PM, Koerber, Mike <Koerber.Mike@epa.gov> wrote:

> Clint: Are you okay with us adding the following blurb on the Sterigenics linked page (Information for Willowbrook, IL, Sterigenics facility) – as an interim step until the Region can develop a more Region 6-like page (assuming they still want to do that)? Thanks.
>
> Mike
>
> ---
>
> **From:** Deamer, Eileen
> **Sent:** Friday, August 24, 2018 2:05 PM
> **To:** Davis, Alison <Davis.Alison@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>
> **Cc:** Grantham, Nancy <Grantham.Nancy@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Payne, James <payne.james@epa.gov>; Thiede, Kurt <thiede.kurt@epa.gov>
> **Subject:** RE: Draft R5 Email
>
> Hi Alison and Kristen -
>
> Here is the short blurb we'd like to use on the R5 Willowbrook page:
>
> **Deliberative Process / Ex. 5**
>
> If you could check with Clint, that this is okay to post on the page where we have the two other links, it would be greatly appreciated.
>
> Thanks!
>
> Eileen Deamer
> U.S. EPA Region 5
> Congressional and Intergovernmental
> (312) 886-1728

Data Review Report

Printed: 05/21/2018 12:39 pm

Analysis	Analyte	CalResult	True Value	% D	% Rec
Lab ID: 1805055-CAL1 Cal Standard					
TO-15 2018 Ethylene Oxide	Ethylene oxide	0.24	0.250	-3.00	97.00
Lab ID: 1805055-CAL2 Cal Standard					
TO-15 2018 Ethylene Oxide	Ethylene oxide	0.43	0.500	-14.41	85.59
Lab ID: 1805055-CAL3 Cal Standard					
TO-15 2018 Ethylene Oxide	Ethylene oxide	0.88	1.00	-11.61	88.39
Lab ID: 1805055-CAL4 Cal Standard					
TO-15 2018 Ethylene Oxide	Ethylene oxide	2.68	2.50	7.26	107.26
Lab ID: 1805055-CAL5 Cal Standard					
TO-15 2018 Ethylene Oxide	Ethylene oxide	5.23	5.00	4.60	104.60

5-11-18

Ambient Air Sampling/Monitoring Plan for Ethylene Oxide Near Sterigenics, Willowbrook, Illinois

May 2018

Introduction

This plan describes the ambient air monitoring activities that the U.S. Environmental Protection Agency (EPA) Region 5 Air and Radiation Division (ARD) plans to monitor adjacent to the Sterigenics facility and take several grab samples in the neighborhoods near the Sterigenics facility in Willowbrook, Illinois.

Section 1: Project Description

1.1 Overview

Healthcare facilities and commercial sterilization facilities often use ethylene oxide (EtO) to sterilize moisture and heat-sensitive medical instruments. In December 2016, EPA updated EtO from a "probable human carcinogen" to a "human carcinogen," while increasing its lifetime inhalation cancer risk estimate about 60 times. This means that EPA now believes EtO is considerably more potent, and more likely to induce cancer in humans than previously thought. [redacted] In response to this [redacted], EPA has developed this plan for monitoring EtO in the ambient air in the neighborhoods surrounding Sterigenics in Willowbrook, Illinois.

1.2 Project Objective

The objective of the ambient air monitoring activities is to reliably detect and quantify ambient air EtO concentration near the Sterigenics facility with EPA Method TO-15 via 12-hour and grab samples. [redacted]

ED_002192_00003982-00001

Section 2: Project Monitoring Design

2.1 Site Selection

Sterigenics in Willowbrook, Illinois is one of several commercial EtO sterilizers in the United States [redacted] more refined AERMOD modeling shows elevated risk. The modeling demonstrates the likely area of highest impact. Also [redacted] in the same industrial complex at 600A Joliet Road, Willowbrook, Illinois. This location will facilitate air monitoring logistics such as site accessibility, security, and electrical access if needed.

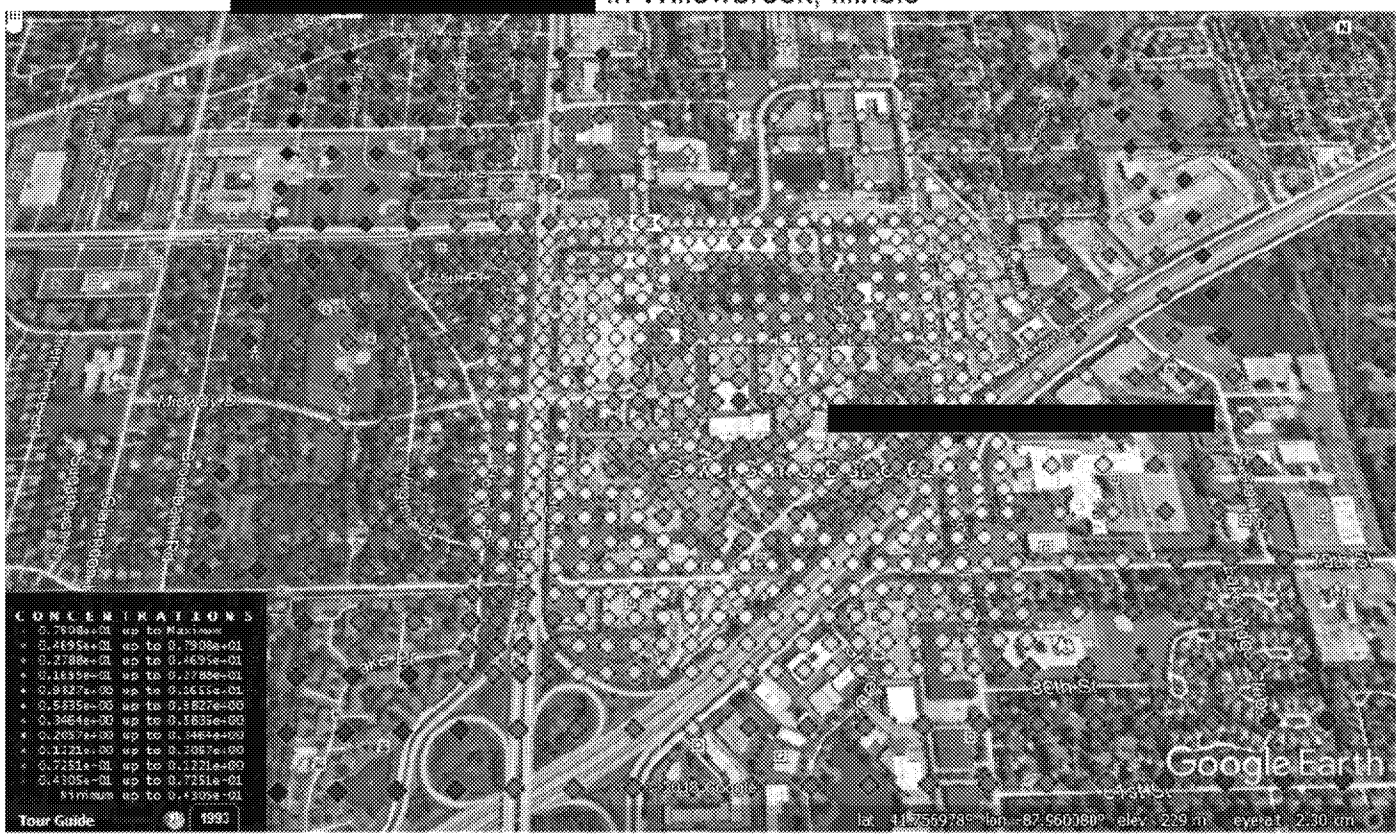
2.2 Monitor Siting

The EPA will follow the monitor siting criteria detailed in the Code of Federal Regulations (CFR) Chapter 40 Section 58, Appendix E, where relevant and appropriate for this monitoring program. EPA and its contractors will consider monitor placement guidelines such as the following:

- Locating the canister in an area that has an unobstructed air flow, especially in the direction of any recognized sources of target analytes (following EPA R5's SOP for canister sampling),
- Avoiding locations that are directly influenced by nearby adjacent, biasing emission sources (e.g., boiler stacks, backup generators, school-bus idling areas) to the extent possible,
- Avoiding locations where reactive surfaces may cause chemical changes in the air sampled,
- Documenting the sampler siting location with information such as digital pictures of the site from the eight cardinal directions, and GPS coordinates.

Figure 1 provides an aerial perspective of the Sterigenics facility.

Figure 1: Map of modeling around the Sterigenics facility [redacted] in Willowbrook, Illinois



2.3 Meteorological Measurements

EPA R5 will measure meteorological data with a portable meteorological station located on the rooftop [redacted]. Measured parameters will include at a minimum wind speed and wind direction).

The MET One sonic wind speed/wind direction sensor (Model MET One Instrument Model (50.5H S/N P22210), automatic directional alignment (3269 S/N R12024) and data logger (Model 466A S/N R12129) was serviced and certified in April/May 2018 and will be certified annually, as necessary and appropriate, and follow the manufacturer's procedures and QA Handbook Volume IV. It was also NIST certified. The meteorological data collected will include wind speed and wind direction. Met data will be downloaded at the end of each sampling event.

As with siting of the air sampling equipment, EPA R5 will follow the standard meteorological monitoring equipment siting criteria (Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV: Meteorological Measurements Version 2.0) where relevant and appropriate for this monitoring program. EPA R5 will site the meteorological monitoring equipment in accordance with the guidelines previously specified in this document for the air sampling equipment, whenever possible. Exceptions to these siting procedures may be necessary due to logistical factors such as security and power availability.

2.4 Measured Pollutant

The site-specific pollutant that the EPA will monitor is EtO (IUPAC name: oxirane, CAS # 75-21-8). ERG will perform the sample analysis for this initial screening.

Section 3: Monitoring Protocols

3.1 Sampling Frequency, Duration, and Quantity

EPA R5 will conduct ambient air sampling during two separate days and one night. Two 12 hour sampling events will be consecutive to obtain one 12 hour day and one 12 hour night sample. Sampling day(s) will be coordinated with ERG and OAQPS regarding this schedule. It is anticipated plan is:
Composite samples (3 events @ 5 12 hr canisters each plus 1 backup = 16 12 hour canisters)
3- 12 hour canisters downwind
1- 12 hr duplicate canister (with a downwind canister)
1- 12 hr upwind
1- extra (backup)

Grab samples (3 events @ 7 grab samples each plus 1 backup = 22 grab sample canisters)
1- upwind
1- near the modeled MIR location
4- downwind
1- duplicate grab sample (with downwind canister)
1- extra (backup)
The field sampling staff will select the grab sampling location based on prevailing wind direction the day of the sampling, such that it is downwind of the facility.

3.2 Field Sampling Methods

Consistency of measurement is necessary to achieve the program objectives described above. The ability to accurately detect pollutant concentrations and evaluate the data to assess the degree to which associated health risks may be present, requires a considerable level of standardization. To achieve these objectives, these ambient air monitoring activities will follow EPA Method TO-15 for the sample collection.

The sampling apparatus will consist of SUMMA or fused silica-lined, 6-liter canisters and critical orifice passive sampling kits that are calibrated for 18 12-hour and 24 grab samples without the use of electricity. The field sampling staff will place the canisters in the field and manually start and stop the sample collection. The inlet height will be approximately 2 meters at the fixed location and at approximately 1.5m for the grab sampling locations. The sampler should remain under vacuum (negative pressure) after sample collection, and delivered to ERG.

The field sampling staff will collect one collocated sample per sampling event. The collocated sample will require a separate sample inlet for each canister at the collocated site. The field sampling staff will select the collocated sampling location based on prevailing wind direction

the day of the sampling, such that it is downwind of the facility. Should the winds that day be light and variable, the field sampling contractor will select the collocated sampling location from the locations that are historically downwind of the facility. Samples will be logged on a chain of custody form provided by ERG, and the form and samples will be sent to ERG.

3.3 Sample Analysis Methods

Like the field sample collection, the analysis of the samples collected for these ambient air monitoring activities will follow EPA Method TO-15.

The analytical laboratory will use sample pre-concentration and Gas Chromatograph (GC)/Mass Selective Detector analysis in Selected-ion Monitoring/Scan mode; will perform GC/Mass Spectrometer calibration curves of EtO; and will use daily Continuing Calibration Verification checks to ensure proper QA/Quality Control (QC) of sample analyses. For instance, the analytical laboratory will use the collocated sample to check method precision.

The analytical laboratory determined the minimum detection limits that will be used to ensure that detection goals are met. The Minimum Detection Limit (MDL) established for EtO by ERG is 0.0502 parts per billion volume (ppbv) or 0.0907 micrograms per cubic meter (ug/m^3).

Along with the analysis of the canisters, to facilitate the field sampling, ERG is responsible for the cleaning of the canisters and sampling apparatus and preparing these and delivering them to R5. ERG will also be responsible for calibrating and verifying the correct operation of the flow controllers to ensure the validity of the 12-hour and grab samples.

Once the sample analysis is validated, ERG will send the data report and data summary to OAQPS and EPA R5.

Section 4: Data Reporting Requirements

4.1 Sample Data

Quality assured ambient monitoring data will be reported by ERG to OAQPS and EPA R5 in ppbv and ug/m^3. ERG will report the date of the sample as the end date of the collection of that sample.

All data, including values below the MDL, will be reported to the OAQPS and EPA R5. Data should not be substituted (e.g., ½ MDL.) If necessary, ERG will report data with the units of ppbv and will use the National Air Toxics Trends Station Technical Assistance Document (Data Management Section) flags. For instance, the data tables will include these QA data flags for data below the MDL and for null data.

4.2 Meteorological Data

Meteorological data will be collected in 1 second intervals utilizing a Met One Sonic wind speed/wind director sensor, automatic directional alignment model and data stored on a data logger.

Section 5: Quality Assurance Project Plan

All environmental data operations associated with EPA's air toxics ambient monitoring program must fully comply with the EPA Publication QA/G5: "Guidance for Quality Assurance Project Plans" (http://www.epa.gov/quality/qa_docs.html). Thus, this monitoring program will follow the national Quality Assurance Project Plan (QAPP) developed by ERG and EPA R5, in accordance with this guidance document.

Section 6: Roles and Responsibilities

EPA R5 is responsible for

- Determining sampling locations
- Site setup and monitoring
- Gathering access information for the sampling locations,
- Establishing and operating the monitoring site(s) and using the sampling and analysis methodology described in this plan, and
- Complying with all other standards and protocols described in this plan, including the timely handling of incoming and outgoing sample media.
- Field sampling activities
- Coordinating the monitoring activities during the sampling period

EPA Headquarters (EPA HQ), through the Office of Air Quality Planning and Standards (OAQPS) is responsible for coordinating with ERG to provide canisters and analyze the canisters after sampling. EPA OAQPS will work jointly with EPA R5 to support data analyses and the development of plans for follow-up actions.

ED_002192_00003982-00006

SUBJECT: Sterigenics, Willowbrook, IL: Ethylene Oxide Air Monitoring

PREPARED BY:

Jacqueline Nwia
Environmental Scientist
Air Monitoring and Analysis Section
Region 5

FIELD MONITORING CONDUCTED BY:

Jacqueline Nwia
Environmental Scientist
Air Monitoring and Analysis Section
Region 5

Margaret Sieffert
Environmental Scientist
Toxics and Global Atmospheres Section
Region 5

FIELD MONITORING REQUESTED BY:

Alexis Cain
Section Chief
Toxics and Global Atmospheres Section
Region 5

DATES OF FIELD MONITORING: May 16-18, 2018

REPORT AUTHORIZED BY:

7/3/18

Michael Compher
Supervisor
Air Monitoring and Analysis Section
Region 5

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ED_002192_00003983-00002

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ED_002192_00003983-00003

Methods:

US EPA Region 5 (R5) utilized the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air Second Edition Compendium Method TO-15 Determination Of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/ Mass Spectrometry (GC/MS) (TO-15) for analyzing samples collected in the area near Sterigenics in Willowbrook, IL. The method entails collecting 12-hour composite or grab ambient air samples in SUMMA canisters, which were prepared by a contract laboratory (Eastern Research Group (ERG) through EPA's national air toxics contract. Once samples were collected, the canisters containing the sampled air were shipped to ERG for ethylene oxide (EtO) analysis using GC/MS.

To aid in the assessment of EtO concentrations, a portable meteorological tower was installed on the roof of a nearby building [redacted] @ 600 Joliet Road, Willowbrook, IL). The meteorological tower collected 5-minute wind speed and wind direction values. The latitude/longitude location of each sample, either 12-hour composite or grab, was recorded using latitude/longitude points obtained through a mobile phone compass application. A sampling plan and Quality Assurance Project Plan (QAPP) were developed for this project. Additional information can be found in the sampling plan (2018May10-EtOSsamplingPlan) and Quality Assurance Project Plan (Sterigenics_QAPP_1.0).

In accordance with the QAPP, ambient EtO concentrations are compared to the minimum detection limit (MDL) which was determined by ERG to be 0.082 ug/m^3 (previously, the MDL was 0.0907 ug/m^3. However, ERG calibrated and recalculated the MDL just prior to analyzing the canister samples from Willowbrook to 0.082 ug/m^3), a concentration associated with an upper-bound lifetime probability of developing cancer of about 410 in a million if exposure occurred continuously at that concentration for 70 years. EPA's revised (2016) upper bound inhalation unit risk estimate of EtO cancer potency is 0.005[1] per ug/m^3. R5 collected ambient air samples around the Sterigenics facility on May 15-18, 2018 to evaluate the concentrations of EtO.

Quality Assurance/Quality Control (QA/QC)

ERG adhered to QA/QC procedures established in their QAPP[2] which was approved by EPA on May 19, 2017. ERG's quality assured/controlled raw data results were provided to EPA in Excel spreadsheet format[3]. In addition to calibration checks and blank sample analysis, ERG performed replicate analysis of each duplicate sample collected in accordance with their QA/QC procedures. All results passed the QA/QC data analysis.

Data Validation

R5's Sterigenics project QAPP[4] requires data validation review by the QA Coordinator, Bilal Qazzaz, to determine whether DQOs are met. However, due to reassignment of work, Marta Fuoco, of the Air

[1] EPA/635/R-16/350Fa, www.epa.gov/iris. Evaluation of the Inhalation Carcinogenicity of Ethylene Oxide (CASRN 75-21-8) In Support of Summary Information on the Integrated Risk Information System (IRIS). December 2016, National Center for Environmental Assessment, Office of Research and Development, U.S. Environmental Protection Agency, Washington, DC.

[2] Support for the EPA National Monitoring Programs (UATMP, NATTS, CSATAM, PAMS, and NMOC Support) Contract No. EP-D-14-030 2017 Quality Assurance Project Plan Category 1.

[3] Eto may 18 voc.xls file sent from [redacted] (ERG) to U.S. EPA on May 30, 2018.

[4] Quality Assurance Project Plan; Sterigenics, Willowbrook, Illinois Ethylene Oxide Air Monitoring Study (Sterigenics_QAPP_1.0)

Monitoring and Assessment Section (AMAS) conducted the data validation review[5]. Data validation procedures identified two invalid data points, specifically, 2 collocated data points (LABSAMPIDs 8051813-08 and 8051813-09) collected on May 16, 2018 (0.158 ug/m^3 and 0.405 ug/m^3) which didn't meet the acceptance criteria of ≤ 30% relative percent difference (RPD) or 5 times the MDL. These 2 data points had an RPD of over 87% (See tables in Appendix A). The 0.158 ug/m^3 value was the lowest sample value collected during this sampling campaign, and it is more challenging for low concentration collocated measure values to meet the 30% RPD criteria.

Data Quality Objectives

The primary objective of ambient air monitoring was to determine whether ethylene oxide is detectable near the Sterigenics facility. Other objectives were to determine how the ambient levels [redacted] more refined AERMOD modeled concentrations[6]. Data is of sufficient quantity and quality to address these questions.

Data quality objectives (DQO) and criteria are identified in the QAPP as follows:

1. Data completeness is 75% of total samples.
    a. Although 2 data points were invalidated out of the total 19 12-hour composite samples, 17 were validated, exceeding the 75% DQO established in the QAPP
    b. All 17 grab samples were validated, exceeding the 75% DQO established in the QAPP.
    c. All samples exceed the ERG's MDL of 0.082 ug/m^3.
    d. Despite shifting winds, review of the data concludes that sufficient downwind samples were collected.

Quality assurance, quality control and data quality objectives and criteria are met with the sampling and analysis conducted for this study.

Results

The tables, graphs and maps below present and illustrate the data and results collected May 16-18, 2018. Table 1 presents all samples and EtO concentrations collected for this study while Tables 2 and 3 separate the 12-hour composite and grab samples. EtO concentrations above the MDL were measured for all 12-hour composite and grab samples.

Table 1: All Results Table (QX=Invalidated data: Failed QC Criteria)

Sampling Date	Sampling Time	Canister Number	Sample Duration	EtO (ug/m^3)	Detection Limit (ug/m^3)
5/16-17/2018	6:41PM - 6:20AM	A21042	11 hrs 39 min	9.09	0.164
5/16-17/2018	6:41PM - 6:20AM	SAT027	11 hrs 39 min (dupicate)	8.33	0.164
5/17/2018	7:27AM - 6:52PM	19650	11 hrs 25 min	8.236	0.082
5/17-18/2018	6:58PM - 6:37AM	18827	11 hrs 39 min	4.94	0.082
5/17/2018	6:54AM - 6:15PM	19662	11 hrs 21 min	4.56	0.082
5/16/2018	1:26 PM	SAT085	Grab	4.34	0.082
5/16/2018	1:12 PM	5132	Grab	4.27	0.082

[5] Deviations from Sterigenics QAPP, Memorandum from Jacqueline Nwia to Bilal Qazzaz, July 3, 2018

[6] [redacted] More refined AERMOD modeling was performed by Region 5's Air Toxics and Assessment Branch staff based on estimated inputs.

Sampling Date	Sampling Time	Canister Number	Sample Duration	EtO (ug/m³)	Detection Limit (ug/m³)
5/16-17/2018	7:01PM - 6:59AM	19641	11 hrs 58 min	3.87	0.082
5/17-18/2018	6:58PM - 6:37AM	5124	11 hrs 39 min (duplicate)	3.69	0.082
5/16/2018	7:21AM - 5:37PM	5142	10 hrs 16 min	3.55	0.082
5/16/2018	12:50 PM	SAT169	Grab (duplicate)	2.28	0.082
5/16/2018	12:50 PM	A21056	Grab	2.17	0.082
5/16-17/2018	7:28PM - 7:12AM	19652	11 hrs 44 min	2.12	0.082
5/16/2018	12:37PM	SAT094	Grab	1.57	0.082
5/17/2018	2:46 PM	SAT009	Grab	1.34	0.082
5/17/2018	10:42 AM	5052	Grab (duplicate)	1.04	0.082
5/17/2018	10:42 AM	SAT173	Grab	1.02	0.082
5/17/2018	6:29AM - 5:53PM	5017	11 hrs 24 min	1.01	0.082
5/17/2018	7:16AM - 6:23PM	18864	11 hrs 7 min	0.979	0.082
5/17/2018	2:33 PM	SAT034	Grab	0.936	0.082
5/17/2018	7:07AM - 6:30PM	5100	11 hrs 23 min	0.867	0.082
5/17/2018	6:29AM - 5:53PM	19290	11 hrs 24 min (duplicate)	0.789	0.082
5/16-17/2018	7:13PM - 7:01AM	SAT074	11 hrs 48 min	0.659	0.082
5/16/2018	7:37AM - 5:50PM	5090	10 hrs 13 min	0.518	0.082
5/17/2018	10:53 AM	A21012	Grab	0.494	0.082
5/16/2018	7:50AM - 5:44PM	SAT007	9 hrs 44 min	0.463	0.082
5/17/2018	2:53 PM	5072	Grab	0.447	0.082
5/17/2018	10:59 AM	5053	Grab	0.411	0.082
5/17/2018	10:20 AM	SAT095	Grab	0.405	0.082
5/16/2018	6:56AM - 5:12PM	SAT166	10 hrs 16 min	QX	0.082
5/16/2018	1:04 PM	SAT061	Grab	0.355	0.082
5/17/2018	10:32 AM	SAT133	Grab	0.338	0.082
5/17-18/2018	6:43PM - 6:29AM	5101	11 hrs 46 min	0.338	0.082
5/17/2018	10:33 AM	A21065	Grab	0.291	0.082
5/17/2018	2:36 PM	SAT101	Grab	0.243	0.082
5/16/2018	12:29PM	19644	Grab	0.221	0.082
5/17/2018	2:27 PM	19294	Grab (duplicate)	0.214	0.082
5/17/2018	3:05 PM	SAT020	Grab	0.206	0.082
5/17/2018	2:59 PM	19651	Grab	0.174	0.082
5/17/2018	2:27 PM	18875	Grab	0.163	0.082
5/16/2018	6:56AM - 5:09PM	19277	10 hrs 13 min (duplicate)	QX	0.082

Table 2: 12-hr Composite Sample Results (QX=Invalidated data: Failed QC Criteria)

Sampling Date	Sampling Time	Canister Number	EtO (ug/m^3)	Detection Limit (ug/m^3)
5/17/2018	7:27AM - 6:52PM	19650	8.236	0.082
5/17/2018	6:54AM - 6:15PM	19662	4.56	0.082
5/16-17/2018	7:01PM - 6:59AM	19641	3.87	0.082
5/16/2018	7:21AM - 5:37PM	5142	3.55	0.082
5/16-17/2018	7:28PM - 7:12AM	19652	2.12	0.082
5/17/2018	7:16AM - 6:23PM	18864	0.979	0.082
5/17/2018	7:07AM - 6:30PM	5100	0.867	0.082
5/16-17/2018	7:13PM - 7:01AM	SAT074	0.659	0.082
5/16/2018	7:37AM - 5:50PM	5090	0.518	0.082
5/16/2018	7:50AM - 5:44PM	SAT007	0.463	0.082
5/17-18/2018	6:43PM - 6:29AM	5101	0.338	0.082
5/16-17/2018	6:41PM - 6:20AM	A21042	9.09	0.164
5/16-17/2018	6:41PM - 6:20AM	SAT027	8.33	0.164
5/17-18/2018	6:58PM - 6:37AM	18827	4.94	0.082
5/17-18/2018	6:58PM - 6:37AM	5124	3.69	0.082
5/17/2018	6:29AM - 5:53PM	5017	1.01	0.082
5/17/2018	6:29AM - 5:53PM	19290	0.789	0.082
5/16/2018	6:56AM - 5:12PM	SAT166	QX	0.082
5/16/2018	6:56AM - 5:09PM	19277	QX	0.082

Table 3: Grab Sample Results

Sampling Date	Sampling Time	Canister Number	EtO (ug/m^3)	Detection Limit (ug/m^3)
5/16/2018	12:50 PM	SAT169	2.28	0.082
5/16/2018	12:50 PM	A21056	2.17	0.082
5/17/2018	10:42 AM	5052	1.04	0.082
5/17/2018	10:42 AM	SAT173	1.02	0.082
5/17/2018	2:27 PM	19294	0.214	0.082
5/17/2018	2:27 PM	18875	0.163	0.082
5/16/2018	1:26 PM	SAT085	4.34	0.082
5/16/2018	1:12 PM	5132	4.27	0.082
5/16/2018	12:37PM	SAT094	1.57	0.082
5/17/2018	2:46 PM	SAT009	1.34	0.082
5/17/2018	2:33 PM	SAT034	0.936	0.082
5/17/2018	10:53 AM	A21012	0.494	0.082
5/17/2018	2:53 PM	5072	0.447	0.082

Sampling Date	Sampling Time	Canister Number	EtO (ug/m^3)	Detection Limit (ug/m^3)
5/17/2018	10:59 AM	5053	0.411	0.082
5/17/2018	10:20 AM	SAT095	0.405	0.082
5/16/2018	1:04 PM	SAT061	0.355	0.082
5/17/2018	10:32 AM	SAT133	0.338	0.082
5/17/2018	10:33 AM	A21065	0.291	0.082
5/17/2018	2:36 PM	SAT101	0.243	0.082
5/16/2018	12:29PM	19644	0.221	0.082
5/17/2018	3:05 PM	SAT020	0.206	0.082
5/17/2018	2:59 PM	19651	0.174	0.082

The figures below were created using Excel and Geoplatform GIS application. Figure 1 is a time series plot illustrating grab and 12-hour composite samples throughout the sampling period. Figure 2 presents results for 12-hour composite and grab samples clustered by event (day/time). The maps illustrate each sampling event with the corresponding wind speed/wind direction plots. Figures 3-9 demonstrate the following:

- In general, predominant daytime winds were from the northeast resulting in higher ambient concentrations measured downwind of Sterigenics (southwest of the facility) (Figures 3,4,6,7 and 8).
- In general, predominant overnight winds were light and variable resulting in some of the highest concentrations measured closer to the facility (@ Willowbrook building) (Figures 5 and 9).
- As noted previously, all samples resulted in concentrations well above the MDL.
- The monitored ambient concentrations coupled with the wind roses demonstrate that Sterigenics is likely the source of the EtO detected in the ambient air since it is the largest source of EtO in the immediate area. The closest known other EtO sources are more than four miles away.

Figure 1: Time Series Plot: All Data

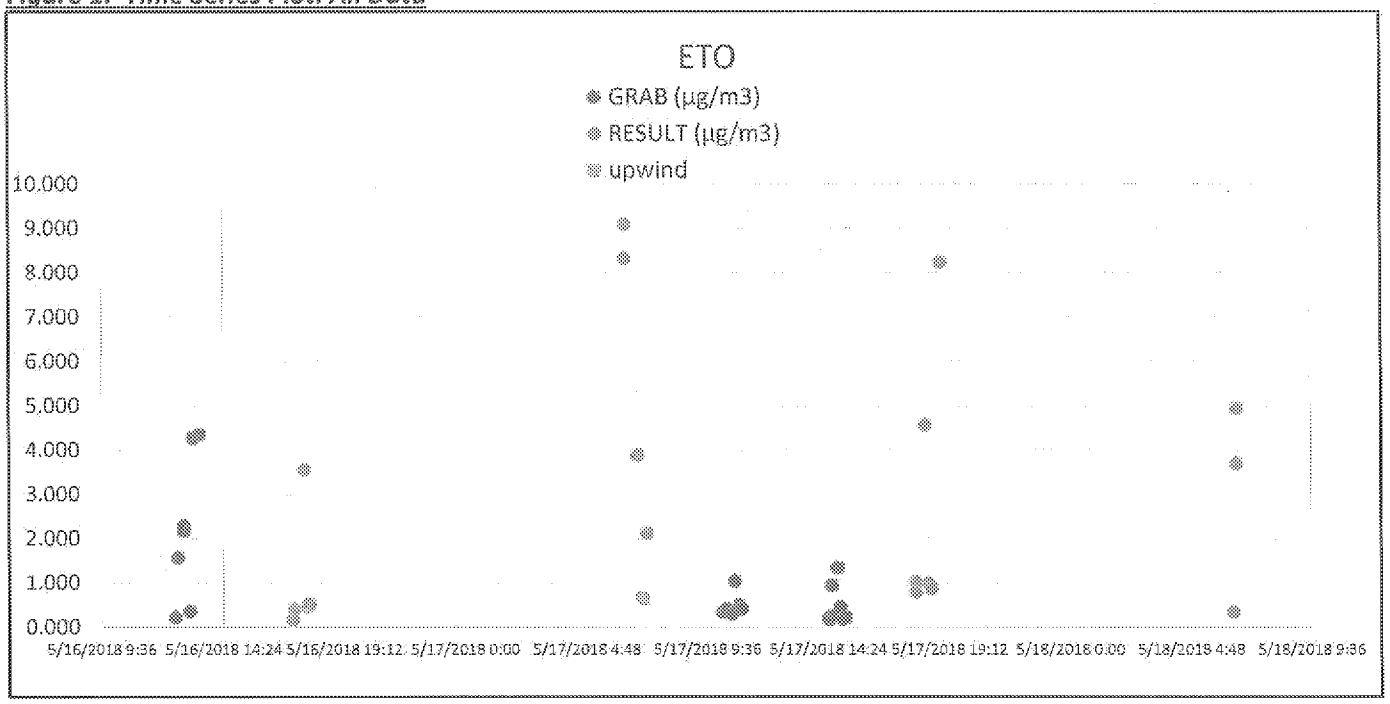


Figure 2: Results Clustered by Sampling Event (Day/time)

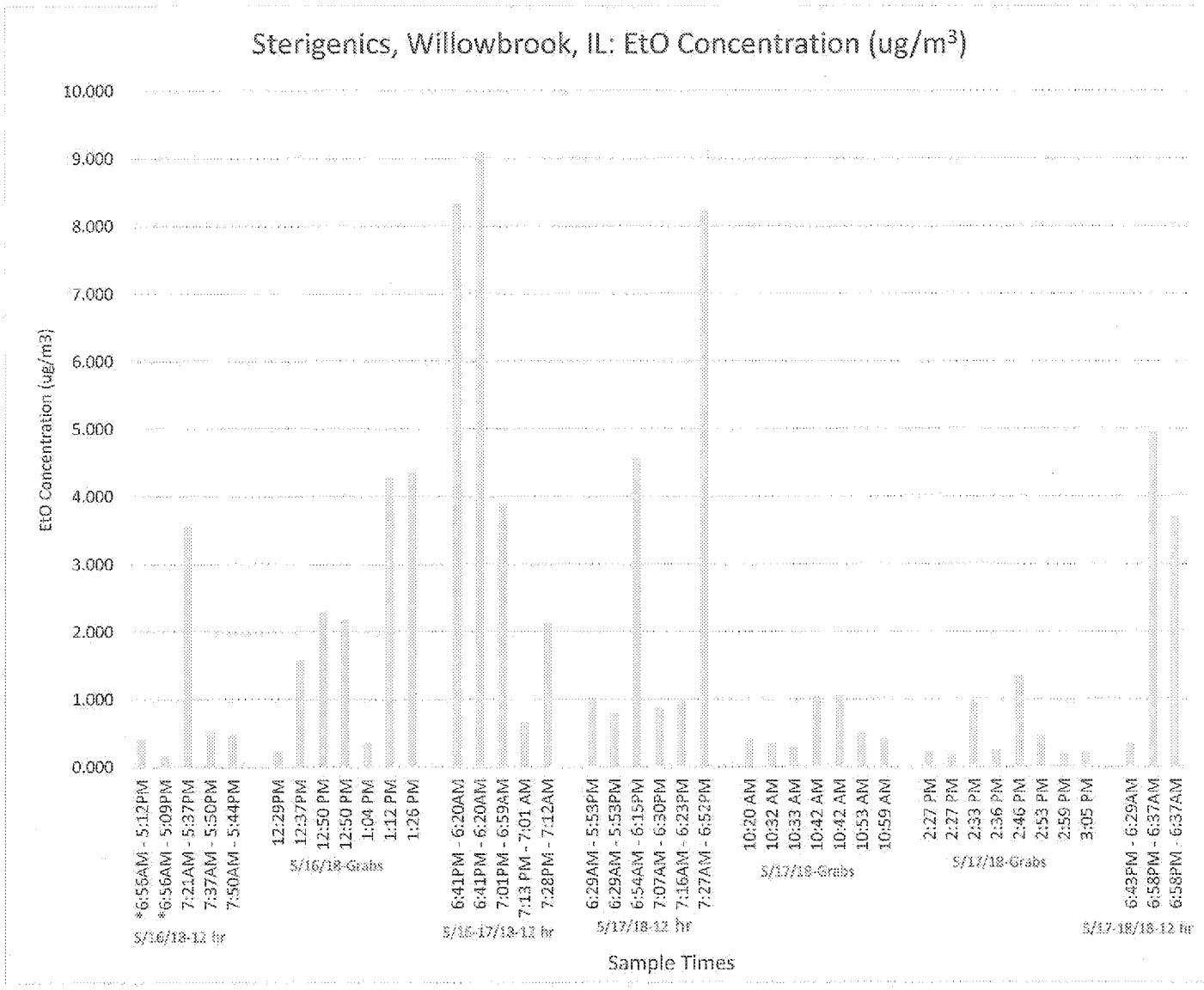


Figure 3: May 16, 2018: 12-hr Daytime Composite Results with Meteorological Data

Figure 4: May 16, 2018: Grab Sample Results with Meteorological Data

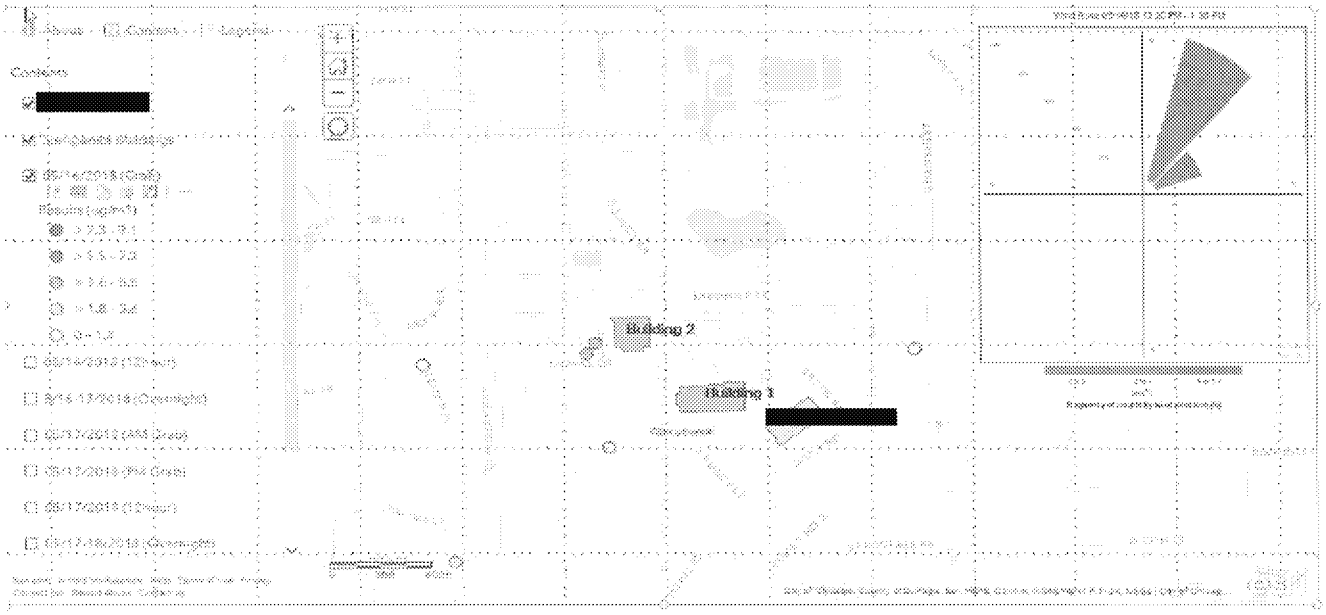


Figure 5: May 16-17, 2018: 12-hr Overnight Composite Results with Meteorological Data

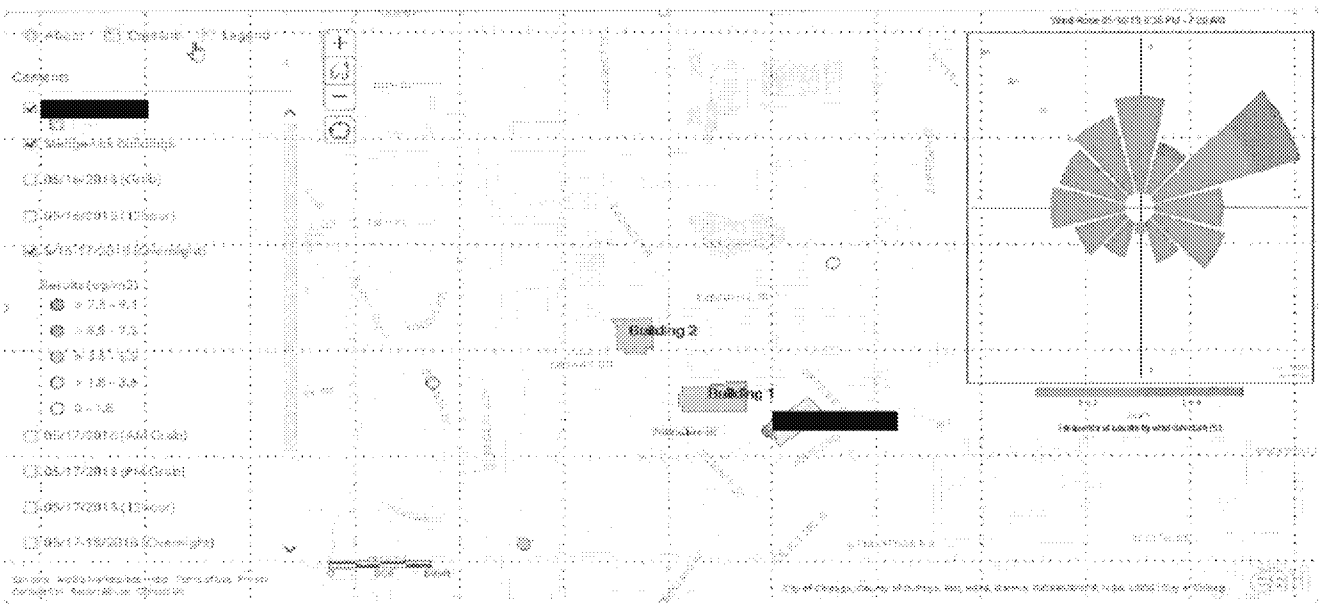


Figure 6: May 17, 2018: 12-hr Daytime Composite Results with Meteorological Data

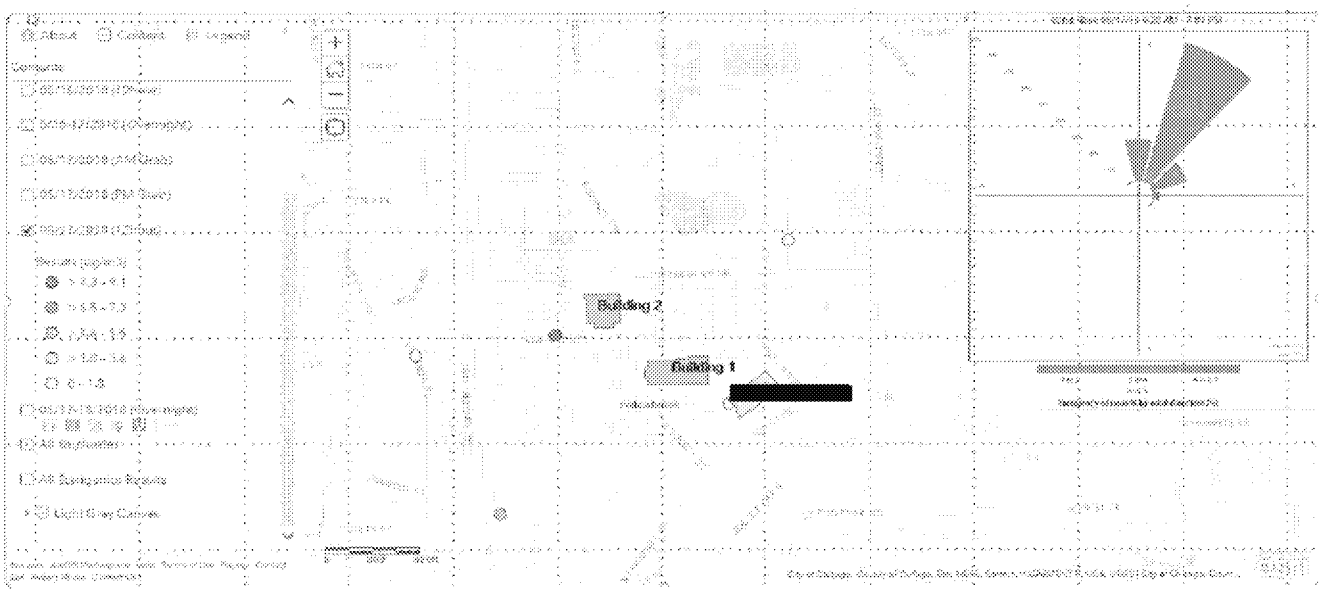


Figure 7: May 17, 2018: Mid-morning Grab Sample Results with Meteorological Data

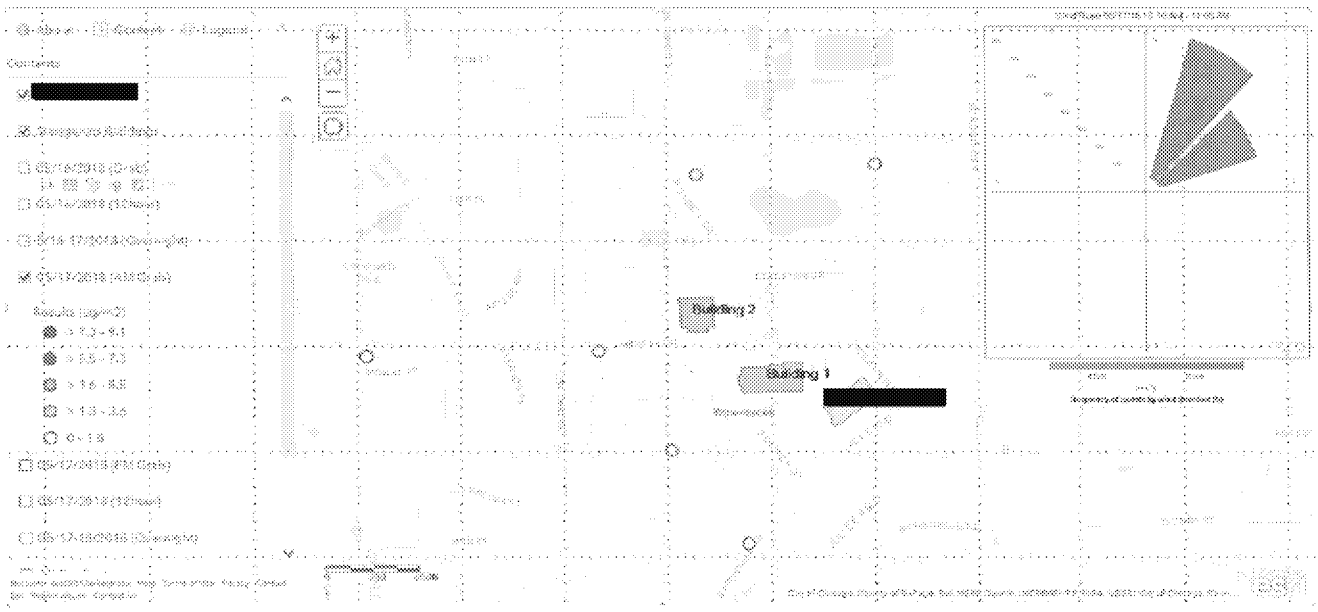


Figure 8: May 17, 2018: Mid-afternoon Grab Sample Results with Meteorological Data

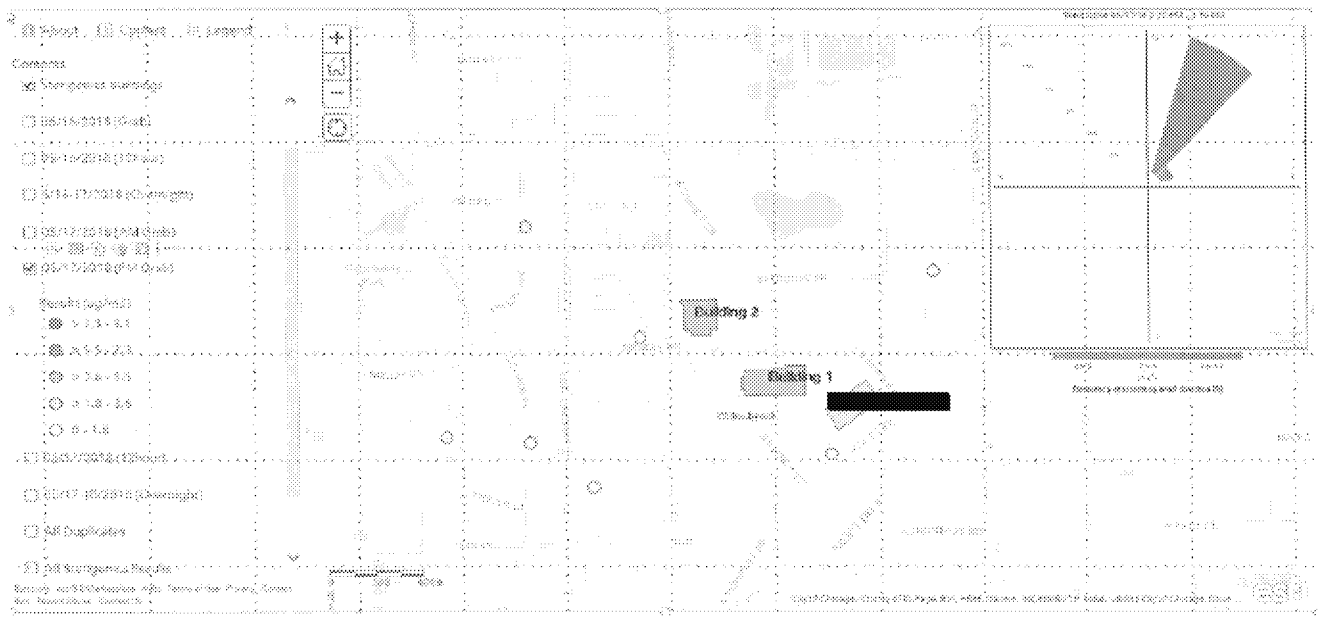
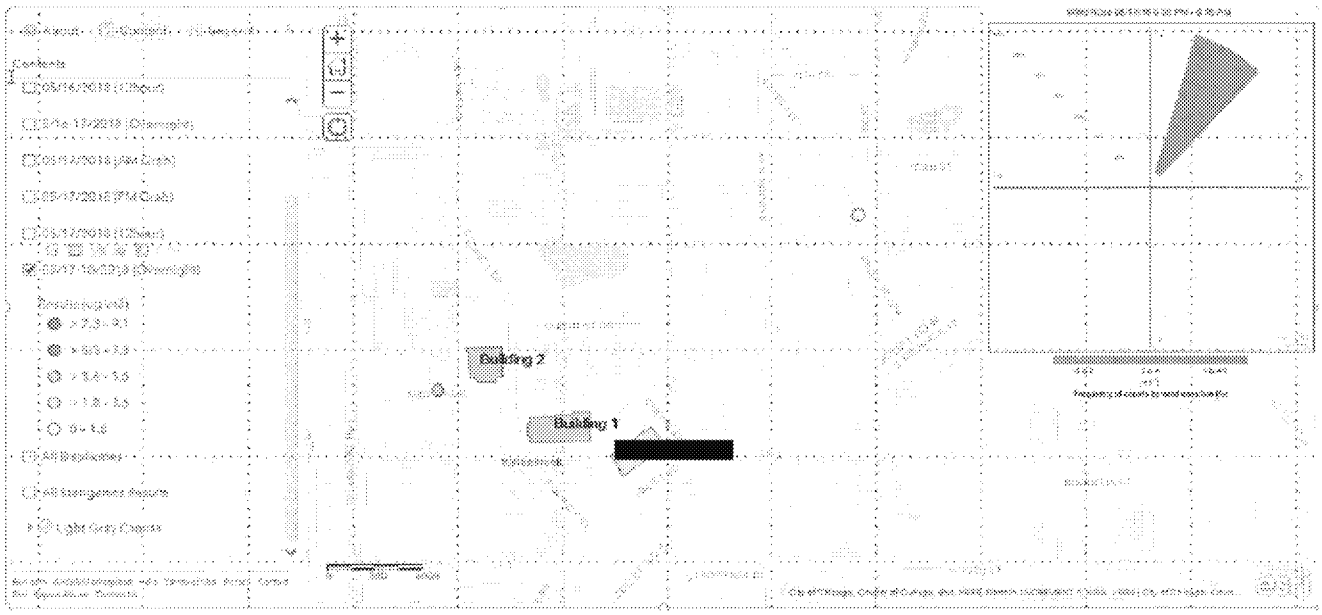


Figure 9: May 17-18, 2018: 12-hr Overnight Composite Results with Meteorological Data



Attachment A

SAMPLENAME	LABSAMPID	SAMPDATE	PREPDATE	ANADATE	RESULT (ppbv)	ANOTE	DL (ppbv)	RESULT (µg/m3)	ANOTE	DL (µg/m3)	RPD (ABS(L4-L5)/R4)*100	Arith Mean	5x MDL	Acceptance criteria (DUP) <30% RPD for cpds > 5xMDL)
EtO Grab 41.7489,-87.9353	8051813-01	5/16/2018 12:30	5/16/2018	5/22/2018	0.122		0.0453	0.221		0.082				
EtO Grab 41.7471,-87.9420	8051813-02	5/16/2018 12:38	5/16/2018	5/22/2018	0.867		0.0453	1.57		0.082				
EtO Grab D1 41.7450,-87.9454	8051813-03	5/16/2018 12:51	5/16/2018	5/21/2018	1.26		0.0453	2.28		0.082	4.878	2.23	0.410	YES
EtO Grab D2 41.7450,-87.9454	8051813-04	5/16/2018 12:51	5/16/2018	5/21/2018	1.2		0.0453	2.17		0.082				
EtO Grab 41.7486,-87.9461	8051813-05	5/16/2018 13:05	5/16/2018	5/22/2018	0.196		0.0453	0.355		0.082				
EtO Grab 41.7490,-87.9423	8051813-06	5/16/2018 13:13	5/16/2018	5/22/2018	2.36		0.0453	4.27		0.082				
EtO Grab 41.7483,-87.9459	8051813-07	5/16/2018 13:27	5/16/2018	5/22/2018	2.4		0.0453	4.34		0.082				
EtO D1 41.7474,-87.9385	8051813-08	5/16/2018 17:06	5/16/2018	5/21/2018	0.0673		0.0453	0.155	DX	0.082	37.918	0.283	0.410	NO
EtO D2 41.7474,-87.9385	8051813-09	5/16/2018 17:13	5/16/2018	5/21/2018	0.224		0.0453	0.405	DX	0.082				
EtO 41.7453,-87.9439	8051813-15	5/16/2018 17:37	5/16/2018	5/22/2018	1.96		0.0453	3.55		0.082				
EtO 41.7505,-87.9371	8051813-17	5/16/2018 17:44	5/16/2018	5/22/2018	0.256		0.0453	0.463		0.082				
EtO 41.7483,-87.9459	8051813-10	5/16/2018 17:50	5/16/2018	5/22/2018	0.286		0.0453	0.518		0.082				
EtO D1 41.7474,-87.9385	8051813-11	5/17/2018 6:20	5/16/2018	5/22/2018	5.02	D	0.0906	9.09	D	0.164	8.732	8.706	0.820	YES
EtO D2 41.7474,-87.9385	8051813-12	5/17/2018 6:20	5/17/2018	5/22/2018	4.6	D	0.0906	8.33	D	0.164				
EtO 41.7453,-87.9439	8051813-16	5/17/2018 6:50	5/17/2018	5/22/2018	2.14		0.0453	3.87		0.082				
Ethylene Oxide Upwind 12hr 41.7505,-87.9371	8051813-13	5/17/2018 7:01	5/17/2018	5/22/2018	0.364		0.0453	0.659		0.082				
EtO 41.7483,-87.9459	8051813-14	5/17/2018 7:12	5/17/2018	5/22/2018	1.17		0.0453	2.12		0.082				
EtO Grab 41.7519,-87.9373	8052134-04	5/17/2018 10:12	5/17/2018	5/23/2018	0.187		0.0453	0.338		0.082				
EtO Grab 41.7517,-87.9415	8052134-07	5/17/2018 10:20	5/17/2018	5/23/2018	0.224		0.0453	0.405		0.082				
EtO Grab 41.7484,-87.9493	8052134-01	5/17/2018 10:34	5/17/2018	5/23/2018	0.161		0.0453	0.291		0.082				
EtO Grab D1 41.7485,-87.9438	8052134-09	5/17/2018 10:42	5/17/2018	5/23/2018	0.564		0.0453	1.02		0.082	1.583	1.029	0.410	YES
EtO Grab D2 41.7485,-87.9438	8052134-10	5/17/2018 10:42	5/17/2018	5/23/2018	0.573		0.0453	1.04		0.082				
EtO Grab 41.7467,-87.9421	8052134-06	5/17/2018 10:53	5/17/2018	5/23/2018	0.273		0.0453	0.494		0.082				
EtO Grab 41.7450,-87.9403	8052134-15	5/17/2018 10:59	5/17/2018	5/23/2018	0.227		0.0453	0.411		0.082				
EtO Grab D1 41.7508,-87.9456	8052134-20	5/17/2018 14:27	5/17/2018	5/24/2018	0.0903		0.0453	0.163		0.082	26.596	0.189	0.410	YES
EtO Grab D2 41.7508,-87.9456	8052134-21	5/17/2018 14:27	5/17/2018	5/24/2018	0.118		0.0453	0.214		0.082				
EtO Grab 41.7469,-87.9455	8052134-19	5/17/2018 14:33	5/17/2018	5/24/2018	0.517		0.0453	0.936		0.082				
EtO Grab 41.7470,-87.9475	8052134-05	5/17/2018 14:36	5/17/2018	5/23/2018	0.134		0.0453	0.243		0.082				
EtO Grab 41.7461,-87.9440	8052134-02	5/17/2018 14:46	5/17/2018	5/23/2018	0.739		0.0453	1.34		0.082				
EtO Grab 41.7488,-87.9429	8052134-16	5/17/2018 14:53	5/17/2018	5/23/2018	0.247		0.0453	0.447		0.082				
EtO Grab 41.7500,-87.9360	8052134-17	5/17/2018 14:59	5/17/2018	5/24/2018	0.0961		0.0453	0.174		0.082				
EtO Grab 41.7467,-87.9384	8052134-03	5/17/2018 15:05	5/17/2018	5/23/2018	0.114		0.0453	0.206		0.082				
EtO D1 41.7474,-87.9385	8052134-22	5/17/2018 17:53	5/17/2018	5/24/2018	0.557		0.0453	1.01		0.082	24.271	0.899	0.410	YES
EtO D2 41.7474,-87.9385	8052134-23	5/17/2018 17:53	5/17/2018	5/24/2018	0.435		0.0453	0.789		0.082				
EtO 41.7453,-87.9439	8052134-08	5/17/2018 18:15	5/17/2018	5/23/2018	2.52		0.0453	4.56		0.082				
EtO 41.7483,-87.9459	8052134-18	5/17/2018 18:23	5/17/2018	5/24/2018	0.541		0.0453	0.979		0.082				
EtO 41.7505,-87.9371	8052134-24	5/17/2018 18:30	5/17/2018	5/24/2018	0.479		0.0453	0.867		0.082				
EtO 41.7487,-87.9426	8052134-14	5/17/2018 18:52	5/17/2018	5/23/2018	4.55		0.0453	8.236		0.082				

ED_002192_00003983-00015

SAMPLENAME	LABSAMPID	SAMPDATE	PREPDATE	ANADATE	RESULT (ppbv)	ANOTE	DL (ppbv)	RESULT (µg/m3)	ANOTE	DL (µg/m3)	RPD (ABS(L4-L5)/R4)*100	Arith Mean	5x MDL	Acceptance criteria (DUP) <30% RPD for cpds > 5xMDL)
EtO 41.7519,-87.9327	8052134-13	5/18/2018 6:29	5/18/2018	5/23/2018	0.187		0.0453	0.338		0.082				
EtO D1 41.7487,-87.9426	8052134-11	5/18/2018 6:37	5/18/2018	5/23/2018	2.73	D-F	0.0453	4.94	D-F	0.082	28.931	4.32	0.410	YES
EtO D2 41.7487,-87.9426	8052134-12	5/18/2018 6:37	5/18/2018	5/23/2018	2.04	D-F	0.0453	3.69	D-F	0.082				

Qualifier Codes: D = This result obtained by dilution; D-F = Duplicate exceeds DQO criteria; QX = Invalidated data/Failed QC Criteria

ED_002192_00003983-00016

Response Factor Report MS1

```
Method Path : C:\msdchem\1\METHODS\
Method File : 8050004_ETOX.M
Title     : TO-15 by Selective Ion Analysis
Last Update  : Mon May 21 13:28:21 2018
Response Via : Initial Calibration

Calibration Files
1   =L18EJ007.D  2   =L18EJ008.D  3   =L18EJ009.D  4   =L18EJ010.D
5   =L18EJ011.D

      Compound             1    2     3     4     5           Avg     %RSD
--------------------------------------------------------------------------------

1) ISS IS-Hexane-d14         ----------------ISTD---------------------
2)     Ethylene Oxide    0.229 0.202 0.209 0.254 0.247       0.228    9.91

3) ISS IS-1,4-Difluoroben... ----------------ISTD---------------------

4) ISS IS-Chlorobenzene-d5   ----------------ISTD---------------------
--------------------------------------------------------------------------
(#) = Out of Range

8050004_ETOX.M Mon May 21 13:40:06 2018 MS1
```

Date	Time	Date_Time	WS	WD
5/15/2018	12:10	5/15/2018 12:10	4.3	35.2
5/15/2018	12:15	5/15/2018 12:15	5.6	37.5
5/15/2018	12:20	5/15/2018 12:20	4.9	27.4
5/15/2018	12:25	5/15/2018 12:25	4.5	29.6
5/15/2018	12:30	5/15/2018 12:30	5.4	30.9
5/15/2018	12:35	5/15/2018 12:35	5	43.2
5/15/2018	12:40	5/15/2018 12:40	3.9	22.2
5/15/2018	12:45	5/15/2018 12:45	3.7	29.9
5/15/2018	12:50	5/15/2018 12:50	4.7	40
5/15/2018	12:55	5/15/2018 12:55	4.6	45.6
5/15/2018	13:00	5/15/2018 13:00	4.4	33.7
5/15/2018	13:05	5/15/2018 13:05	4.2	32.1
5/15/2018	13:10	5/15/2018 13:10	3.4	41.2
5/15/2018	13:15	5/15/2018 13:15	3.4	25.5
5/15/2018	13:20	5/15/2018 13:20	2.9	36.2
5/15/2018	13:25	5/15/2018 13:25	3.6	54.9
5/15/2018	13:30	5/15/2018 13:30	3.2	65
5/15/2018	13:35	5/15/2018 13:35	3.3	69.5
5/15/2018	13:40	5/15/2018 13:40	3.9	59.3
5/15/2018	13:45	5/15/2018 13:45	2.8	83.6
5/15/2018	13:50	5/15/2018 13:50	3.4	68.3
5/15/2018	13:55	5/15/2018 13:55	3.7	59.1
5/15/2018	14:00	5/15/2018 14:00	3.6	61.3
5/15/2018	14:05	5/15/2018 14:05	2.9	67.3
5/15/2018	14:10	5/15/2018 14:10	2.7	68
5/15/2018	14:15	5/15/2018 14:15	3.4	82.1
5/15/2018	14:20	5/15/2018 14:20	4	63.5
5/15/2018	14:25	5/15/2018 14:25	4.3	53.4
5/15/2018	14:30	5/15/2018 14:30	3.4	46.4
5/15/2018	14:35	5/15/2018 14:35	3.9	54.9
5/15/2018	14:40	5/15/2018 14:40	4.6	61.6
5/15/2018	14:45	5/15/2018 14:45	4.5	62.4
5/15/2018	14:50	5/15/2018 14:50	3.6	57.5
5/15/2018	14:55	5/15/2018 14:55	4.5	59.5
5/15/2018	15:00	5/15/2018 15:00	5	53.9
5/15/2018	15:05	5/15/2018 15:05	5.1	53.8
5/15/2018	15:10	5/15/2018 15:10	4.6	53.9
5/15/2018	15:15	5/15/2018 15:15	3.9	46.2
5/15/2018	15:20	5/15/2018 15:20	4.6	29.4
5/15/2018	15:25	5/15/2018 15:25	4.8	16.5
5/15/2018	15:30	5/15/2018 15:30	4.5	14.4
5/15/2018	15:35	5/15/2018 15:35	4.7	35.8
5/15/2018	15:40	5/15/2018 15:40	4	23.7
5/15/2018	15:45	5/15/2018 15:45	4.4	12.7
5/15/2018	15:50	5/15/2018 15:50	4.2	11.9
5/15/2018	15:55	5/15/2018 15:55	4.6	3.3

5/15/2018	16:00	5/15/2018 16:00	4.7	19.1
5/15/2018	16:05	5/15/2018 16:05	4.3	16.2
5/15/2018	16:10	5/15/2018 16:10	4.6	18.4
5/15/2018	16:15	5/15/2018 16:15	4.2	22.8
5/15/2018	16:20	5/15/2018 16:20	4	11
5/15/2018	16:25	5/15/2018 16:25	3.7	358.7
5/15/2018	16:30	5/15/2018 16:30	4.1	13.7
5/15/2018	16:35	5/15/2018 16:35	4.6	351.5
5/15/2018	16:40	5/15/2018 16:40	4.5	358.2
5/15/2018	16:45	5/15/2018 16:45	4.6	8.8
5/15/2018	16:50	5/15/2018 16:50	3.7	8.2
5/15/2018	16:55	5/15/2018 16:55	4	352.4
5/15/2018	17:00	5/15/2018 17:00	4.4	12.3
5/15/2018	17:05	5/15/2018 17:05	4.3	17
5/15/2018	17:10	5/15/2018 17:10	4	16.4
5/15/2018	17:15	5/15/2018 17:15	2.7	4.6
5/15/2018	17:20	5/15/2018 17:20	4	354.5
5/15/2018	17:25	5/15/2018 17:25	4.3	353.1
5/15/2018	17:30	5/15/2018 17:30	4.1	359.4
5/15/2018	17:35	5/15/2018 17:35	4.7	4
5/15/2018	17:40	5/15/2018 17:40	5.1	350.5
5/15/2018	17:45	5/15/2018 17:45	4.5	354.7
5/15/2018	17:50	5/15/2018 17:50	4.5	11.1
5/15/2018	17:55	5/15/2018 17:55	4.9	9.7
5/15/2018	18:00	5/15/2018 18:00	4.5	3.1
5/15/2018	18:05	5/15/2018 18:05	4.8	352.4
5/15/2018	18:10	5/15/2018 18:10	4.5	1.6
5/15/2018	18:15	5/15/2018 18:15	4.3	16.3
5/15/2018	18:20	5/15/2018 18:20	4.6	21.7
5/15/2018	18:25	5/15/2018 18:25	4.8	15.6
5/15/2018	18:30	5/15/2018 18:30	4.6	14.9
5/15/2018	18:35	5/15/2018 18:35	4.1	4.8
5/15/2018	18:40	5/15/2018 18:40	4.6	4
5/15/2018	18:45	5/15/2018 18:45	4.7	14.6
5/15/2018	18:50	5/15/2018 18:50	4.6	14.4
5/15/2018	18:55	5/15/2018 18:55	5.2	13.6
5/15/2018	19:00	5/15/2018 19:00	4.2	5.4
5/15/2018	19:05	5/15/2018 19:05	3.4	1.3
5/15/2018	19:10	5/15/2018 19:10	4.3	358
5/15/2018	19:15	5/15/2018 19:15	4.2	4.5
5/15/2018	19:20	5/15/2018 19:20	3.6	5.1
5/15/2018	19:25	5/15/2018 19:25	3.7	5.5
5/15/2018	19:30	5/15/2018 19:30	4.2	6.9
5/15/2018	19:35	5/15/2018 19:35	4	13.3
5/15/2018	19:40	5/15/2018 19:40	3.9	8.4
5/15/2018	19:45	5/15/2018 19:45	4.1	3.3
5/15/2018	19:50	5/15/2018 19:50	4.2	4

5/15/2018	19:55	5/15/2018 19:55	4.5	9.9
5/15/2018	20:00	5/15/2018 20:00	4	12
5/15/2018	20:05	5/15/2018 20:05	3.5	14
5/15/2018	20:10	5/15/2018 20:10	3.6	13.3
5/15/2018	20:15	5/15/2018 20:15	3.5	12.5
5/15/2018	20:20	5/15/2018 20:20	3.8	13.9
5/15/2018	20:25	5/15/2018 20:25	3.1	16.9
5/15/2018	20:30	5/15/2018 20:30	3.1	9.9
5/15/2018	20:35	5/15/2018 20:35	2.5	8.4
5/15/2018	20:40	5/15/2018 20:40	3	8.2
5/15/2018	20:45	5/15/2018 20:45	3.4	12.2
5/15/2018	20:50	5/15/2018 20:50	4	16.2
5/15/2018	20:55	5/15/2018 20:55	4.4	18.6
5/15/2018	21:00	5/15/2018 21:00	4.9	17.2
5/15/2018	21:05	5/15/2018 21:05	4.7	26.5
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5/16/2018	6:40	5/16/2018 6:40	1.2	26.7
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5/16/2018	7:20	5/16/2018 7:20	1.2	9.5
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5/16/2018	15:20	5/16/2018 15:20	3.7	39.2
5/16/2018	15:25	5/16/2018 15:25	3.2	52.3

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5/16/2018	15:35	5/16/2018 15:35	3	39.6
5/16/2018	15:40	5/16/2018 15:40	2.4	86.2
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5/16/2018	16:10	5/16/2018 16:10	2.4	60
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5/16/2018	16:25	5/16/2018 16:25	2.6	70.8
5/16/2018	16:30	5/16/2018 16:30	3	71.1
5/16/2018	16:35	5/16/2018 16:35	2.5	68.7
5/16/2018	16:40	5/16/2018 16:40	2.4	98
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5/16/2018	17:15	5/16/2018 17:15	2.4	70.9
5/16/2018	17:20	5/16/2018 17:20	2.6	62.1
5/16/2018	17:25	5/16/2018 17:25	2.1	73.9
5/16/2018	17:30	5/16/2018 17:30	2.8	70.6
5/16/2018	17:35	5/16/2018 17:35	2.4	85.4
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5/16/2018	18:15	5/16/2018 18:15	2.5	75.5
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5/16/2018	18:25	5/16/2018 18:25	2.1	53.1
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5/16/2018	18:45	5/16/2018 18:45	2.4	68
5/16/2018	18:50	5/16/2018 18:50	2.4	69.6
5/16/2018	18:55	5/16/2018 18:55	2.3	73.1
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5/16/2018	19:10	5/16/2018 19:10	2.6	33
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5/16/2018	19:35	5/16/2018 19:35	2.1	62.9
5/16/2018	19:40	5/16/2018 19:40	1.8	64.1
5/16/2018	19:45	5/16/2018 19:45	1.6	71.5
5/16/2018	19:50	5/16/2018 19:50	1.6	73.3
5/16/2018	19:55	5/16/2018 19:55	1.6	69.6
5/16/2018	20:00	5/16/2018 20:00	1.6	74.1
5/16/2018	20:05	5/16/2018 20:05	1.5	68.6
5/16/2018	20:10	5/16/2018 20:10	1.6	57.5
5/16/2018	20:15	5/16/2018 20:15	1.3	62.8
5/16/2018	20:20	5/16/2018 20:20	1.4	67.4
5/16/2018	20:25	5/16/2018 20:25	1.2	57.7
5/16/2018	20:30	5/16/2018 20:30	1.3	49.3
5/16/2018	20:35	5/16/2018 20:35	1.3	53.3
5/16/2018	20:40	5/16/2018 20:40	0.8	54
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5/16/2018	21:15	5/16/2018 21:15	1	100.5
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5/16/2018	21:25	5/16/2018 21:25	1.1	105.4
5/16/2018	21:30	5/16/2018 21:30	1	93.3
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5/16/2018	21:40	5/16/2018 21:40	0.7	94.9
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5/17/2018	0:35	5/17/2018 0:35	0.3	225.8
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5/17/2018	11:30	5/17/2018 11:30	2.9	28.7
5/17/2018	11:35	5/17/2018 11:35	2.7	38.2
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5/17/2018	13:35	5/17/2018 13:35	3.3	29.6
5/17/2018	13:40	5/17/2018 13:40	3.5	34.5
5/17/2018	13:45	5/17/2018 13:45	3.8	24.9
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5/17/2018	16:15	5/17/2018 16:15	4.8	10
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5/17/2018	18:05	5/17/2018 18:05	4.3	9.8
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5/17/2018	18:15	5/17/2018 18:15	4.1	9.1
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5/17/2018	18:30	5/17/2018 18:30	3.5	7.7
5/17/2018	18:35	5/17/2018 18:35	3.8	25.9
5/17/2018	18:40	5/17/2018 18:40	4.6	29.3
5/17/2018	18:45	5/17/2018 18:45	4.1	18.8
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5/17/2018	19:00	5/17/2018 19:00	4.8	30
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5/17/2018	19:10	5/17/2018 19:10	3.9	16.5
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5/17/2018	19:30	5/17/2018 19:30	4.3	21.2
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5/18/2018	18:55	5/18/2018 18:55	2.6	31
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5/18/2018	19:05	5/18/2018 19:05	2.4	29.2
5/18/2018	19:10	5/18/2018 19:10	2.8	33.2
5/18/2018	19:15	5/18/2018 19:15	2.8	29.4
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5/18/2018	19:25	5/18/2018 19:25	2.9	31.6
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5/18/2018	23:20	5/18/2018 23:20	2.4	54.3
5/18/2018	23:25	5/18/2018 23:25	2.3	51.2
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5/19/2018	11:45	5/19/2018 11:45	2.8	271.1
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5/19/2018	12:30	5/19/2018 12:30	2.6	262.2
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5/19/2018	17:50	5/19/2018 17:50	2.1	309.1

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5/19/2018	18:00	5/19/2018 18:00	2	323.3
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5/19/2018	18:25	5/19/2018 18:25	1.8	334.5
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5/19/2018	18:35	5/19/2018 18:35	1.3	335.1
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5/19/2018	18:45	5/19/2018 18:45	1.9	359.6
5/19/2018	18:50	5/19/2018 18:50	2	10.3
5/19/2018	18:55	5/19/2018 18:55	1.5	345.7
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5/19/2018	20:10	5/19/2018 20:10	2.5	58.5
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5/19/2018	21:45	5/19/2018 21:45	0.8	90.7

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5/19/2018	22:10	5/19/2018 22:10	1.3	97.8
5/19/2018	22:15	5/19/2018 22:15	1.1	99.6
5/19/2018	22:20	5/19/2018 22:20	1.1	145.4
5/19/2018	22:25	5/19/2018 22:25	1.8	184.4
5/19/2018	22:30	5/19/2018 22:30	0.9	191.7
5/19/2018	22:35	5/19/2018 22:35	0.8	121.1
5/19/2018	22:40	5/19/2018 22:40	1.2	49.2
5/19/2018	22:45	5/19/2018 22:45	0.8	40.4
5/19/2018	22:50	5/19/2018 22:50	1.1	54.2
5/19/2018	22:55	5/19/2018 22:55	1.2	55.5
5/19/2018	23:00	5/19/2018 23:00	1.2	62.6
5/19/2018	23:05	5/19/2018 23:05	1.4	63.2
5/19/2018	23:10	5/19/2018 23:10	1.6	52.1
5/19/2018	23:15	5/19/2018 23:15	1.7	59.3
5/19/2018	23:20	5/19/2018 23:20	1.3	38
5/19/2018	23:25	5/19/2018 23:25	1.8	25.3
5/19/2018	23:30	5/19/2018 23:30	1.6	24.7
5/19/2018	23:35	5/19/2018 23:35	1.7	18.8
5/19/2018	23:40	5/19/2018 23:40	1.8	12.5
5/19/2018	23:45	5/19/2018 23:45	2.5	25.7
5/19/2018	23:50	5/19/2018 23:50	2.6	35.3
5/19/2018	23:55	5/19/2018 23:55	2.8	31.6
5/19/2018	0:00	5/19/2018 0:00	1.9	43.4

AdvaMed
Advanced Medical Technology Association

iBIO

October 4, 2018

Office of Illinois Attorney General
The Honorable Lisa Madigan
Attention: Matthew Dunn
Division Chief, Environmental Enforcement Division
500 South 2nd Street
Springfield, IL 62704

Dear Attorney General Madigan:

We are writing on behalf of AdvaMed and iBIO members concerning Sterigenics International in Willowbrook, Illinois, and the ongoing circumstances surrounding alleged elevated health risks as a result of ethylene oxide sterilization at the facility. We are aware that Gov. Rauner has referred the case to you for review. As you consider options, we ask that you please keep in mind the effect that any long-term disruption of ethylene oxide sterilization would have on patient access to life-changing technology.

The Advanced Medical Technology Association (AdvaMed) is a trade association that represents the world's leading innovators and manufacturers of medical devices, diagnostic products, and health information systems. Together, our members, most with fewer than 100 employees, support nearly 2 million jobs nationwide, produce $150 billion in direct economic output, and manufacture much of the life-enhancing health care technology available in the United States and around the world.

The Illinois Biotechnology Innovation Organization (iBIO) is a life sciences industry association of more than 200 members comprised of life sciences companies, universities, academic institutions, service providers, and others dedicated to making Illinois and the surrounding Midwest one of the world's top life sciences centers.

At its core, our industry shares in your mission to protect and advance the human condition, and we support the Attorney General's mission to advocate on behalf of the people of Illinois. Our members have invested hundreds of millions of dollars to improve workplace safety and environmental health. Through the implementation of new technology, our members have continued to reduce employee exposure and emissions of toxic substances to facilitate compliance with current OSHA and NESHAP regulations. We are equally committed to guaranteeing safe devices for patients, as well as a safe environment for manufacturers' employees and their surrounding communities.

701 Pennsylvania Ave, N.W. | Suite 800 | Washington, D.C. 20004-2654 | AdvaMed.org
171 N Aberdeen St. | Suite 400 | Chicago, IL 60607 | iBIO.org

Ethylene oxide (EtO) is critical to ensuring the safety of devices for clinicians and patients, and we understand that EtO's application as a sterilant for health care products accounts for less than 1% of all EtO usage globally. Many of our members manufacture devices that cannot be sterilized by other means due to their complex nature, including pacemakers, implantable defibrillators, and combination products (devices that contain drugs). The Willowbrook Sterigenics facility, like many EtO sterilization process plants, is the sole sterilization facility for a number of medical device types. A disruption in production at this facility would halt sterilization of those products and result in an abrupt stop in the supply chain for those devices. Identifying a different facility, filing for use, and validating sterilization cycles at that facility can take months. This cessation could result in limited access to critical medical technology for millions of patients and lead to poorer health outcomes.

In 2014, AdvaMed expressed concerns to the EPA regarding the Agency's risk estimates of ethylene oxide and the Integrated Risk Information System (IRIS) Evaluation of the Inhalation Carcinogenicity of Ethylene Oxide (revised external draft-August 2014). Along with the American Chemistry Council and the Ethylene Oxide Sterilization Association Inc., we questioned the reliability and accuracy of the assessment and omission of several studies deemed relevant by the Science Advisory Board. It is our understanding that this IRIS assessment is the basis for the concern raised with regard to the Willowbrook Sterigenics facility.

We have the utmost respect for the Office of the Attorney General of Illinois and know that it will act in the best interest of the environment and all residents. In doing so, please consider the essential role the Willowbrook Sterigenics facility, and EtO in general, holds in the medical technology supply chain. Closure of this plant could affect access to important devices and thousands of Americans who benefit from medical technology.

Thank you for your attention to this matter

Sincerely,

Scott Whitaker
President & CEO
AdvaMed

John Conrad
President & CEO
iBIO

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1990

IN THE CIRCUIT COURT OF THE EIGHTEENTH JUDICIAL CIRCUIT
DUPAGE COUNTY, ILLINOIS
CHANCERY DIVISION

FILED
2015 SEP 18 AM 9:21

PEOPLE OF THE STATE OF ILLINOIS, *ex rel.* LISA MADIGAN, Attorney General of the State of Illinois,	)	
Plaintiff,	)	
v.	)	No. 2015 CH 651
STERIGENICS U.S., LLC, a Delaware limited liability company,	)	
Defendant.	)	

CASE CLOSED
JUDGE'S INIT.

CONSENT ORDER

Plaintiff, PEOPLE OF THE STATE OF ILLINOIS, *ex rel.* LISA MADIGAN, Attorney General of the State of Illinois, the Illinois Environmental Protection Agency ("Illinois EPA"), and Defendant, STERIGENICS U.S., LLC, (collectively, "Parties to the Consent Order") have agreed to the making of this Consent Order and submit it to this Court for approval.

I. INTRODUCTION

This stipulation of facts is made and agreed upon for purposes of settlement only and as a factual basis for the Court's entry of the Consent Order and issuance of any injunctive relief. None of the facts stipulated herein shall be introduced into evidence in any other proceeding regarding the violations of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/1 *et seq.* (2014), and the Illinois Pollution Control Board ("Board") Regulations, alleged in the Complaint except as otherwise provided herein. It is the intent of the parties to this Consent Order that it be a final judgment on the merits of this matter.

ED_002192_00004064-00001

A. Parties

1. On April 3, 2015, a Complaint was filed on behalf of the People of the State of Illinois by Lisa Madigan, Attorney General of the State of Illinois, on her own motion and upon the request of the Illinois EPA, pursuant to Section 42(d) and (e) of the Act, 415 ILCS 5/42(d) and (e) (2014), against the Defendant.

2. The Illinois EPA is an administrative agency of the State of Illinois, created pursuant to Section 4 of the Act, 415 ILCS 5/4 (2014).

3. At all times relevant to the Complaint, Defendant Sterigenics U.S., LLC was, and is, a Delaware limited liability company, and operated a gaseous sterilization business located at 7775 Quincy Street, Willowbrook, DuPage County, Illinois ("Facility" or "Site").

4. The Defendant's sterilization process uses ethylene oxide, a hazardous air pollutant, and generates ethylene glycol and other chemicals.

5. Plaintiff has alleged that, on or about October 7, 2013, the Defendant released ethylene glycol into soil and groundwater at, and in the vicinity of, the Site.

6. On October 21, 2013, the Defendant reported the uncontrolled release of 30 pounds of ethylene oxide gas to the atmosphere. The Defendant subsequently revised its estimate of the quantity of ethylene oxide released to approximately 12 pounds.

B. Allegations of Non-Compliance

Plaintiff contends that the Defendant has violated the following provisions of the Act and Board Regulations:

Count I: WATER POLLUTION, violation of 415 ILCS 5/12(a) (2014);

Count II: CREATING A WATER POLLUTION HAZARD, violation of 415

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ILCS 5/12(d) (2014);

Count III: VIOLATION OF GENERAL USE WATER QUALITY STANDARDS, 415 ILCS 5/9(a) (2014), and 35 Ill. Adm. Code 302.203;

Count IV: NPDES PERMIT VIOLATION, 415 ILCS 5/12(f) (2014), and 35 Ill. Adm. Code 309.102;

Count V: AIR POLLUTION, violation of 415 ILCS 5/9(a) (2014) and 35 Ill. Adm. Code 201.141;

Count VI: VIOLATION OF CAAPP PERMIT CONDITIONS: FAILURE TO COMPLY WITH NESHAP EMISSION STANDARDS, 415 ILCS 5/9.1(d) (2014), 415 ILCS 5/39.5(6) (2014), 40 CFR 63.362(a), and Conditions 7.1.6(c)(1) and 7.1.3(b)(ii) of CAAPP Permit No. 95120085;

Count VII: VIOLATION OF CAAPP PERMIT CONDITIONS: FAILURE TO COMPLY WITH EMISSION LIMITATIONS FOR THE CHICAGO AREA, 415 ILCS 5/9(a) (2014), 415 ILCS 5/39.5(6) (2014), 35 Ill. Adm. Code 218.986(a), and Condition 7.1.3(d)(i) of CAAPP Permit No. 95120085.

C. Non-Admission of Violations

The Defendant represents that it has entered into this Consent Order for the purpose of settling and compromising disputed claims without having to incur the expense of contested litigation. By entering into this Consent Order and complying with its terms, the Defendant does not affirmatively admit the allegations of violation within the Complaint and referenced above, and this Consent Order shall not be interpreted as including such admission.

D. Compliance Activities to Date

1. On January 13, 2014, the Defendant applied to enter its Facility into Illinois EPA's voluntary Site Remediation Program ("SRP") to address remediation of the release of ethylene glycol, propylene glycol and sulfate from the Facility. The Facility remediation project

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was designated under the SRP as the "Sterigenics US LLC site, LPC No. 0431105032" ("On Site SRP").

2. On November 18, 2014, Illinois EPA issued a No Further Remediation letter ("NFR letter") to the Defendant for the work performed under the On-Site SRP. The Defendant recorded the NFR letter for the On-Site SRP with the office of the DuPage County Recorder on December 5, 2014.

3. On July 13, 2014, the Defendant applied to enter off-site areas which were affected, or potentially affected, by the release of ethylene glycol, propylene glycol, and sulfate into the SRP. The off-site remediation project has been designated by Illinois EPA as the "Willowbrook Centre Joint Venture, LPC No. 0431105077" ("Off-Site SRP").

4. On May 29, 2015, Illinois EPA issued an NFR letter to the Defendant for work performed under the Off-Site SRP. The Defendant recorded the NFR letter for the Off-Site SRP with the office of the DuPage County Recorder on July 6, 2015.

II. APPLICABILITY

This Consent Order shall apply to and be binding upon the Parties to the Consent Order. The Defendant waives as a defense to any enforcement action taken pursuant to this Consent Order the failure of any of its officers, directors, agents, employees or successors or assigns to take such action as shall be required to comply with the provisions of this Consent Order. This Consent Order may be used against the Defendant in any subsequent enforcement action or permit proceeding as proof of a past adjudication of violation of the Act and the Board Regulations for all violations alleged in the Complaint in this matter, for purposes of Sections 39 and 42 of the Act, 415 ILCS 5/39 and 42 (2014).

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III. JUDGMENT ORDER

This Court has jurisdiction of the subject matter herein and of the Parties to the Consent Order and, having considered the stipulated facts and being advised in the premises, finds the following relief appropriate:

IT IS HEREBY ORDERED, ADJUDGED AND DECREED:

A. Civil Penalty

1. The Defendant shall pay a civil penalty of Fifty Thousand Dollars ($50,000.00). Payment shall be tendered at time of entry of the Consent Order.

2. The civil penalty payment shall be made by certified check or money order payable to the Illinois EPA for deposit into the Environmental Protection Trust Fund ("EPTF").

3. The case name and case number shall appear on the face of the certified check or money order.

B. Future Compliance

1. The Defendant shall comply with the terms and conditions of its Clean Air Act Permit Program ("CAAPP) Permit.

2. This Consent Order in no way affects the responsibilities of the Defendant to comply with any other federal, state or local laws or regulations, including but not limited to the Act and the Board Regulations.

3. The Defendant shall cease and desist from future violations of the Act and Board Regulations that were the subject matter of the Complaint.

C. Enforcement and Modification of Consent Order

1. This Consent Order is a binding and enforceable order of this Court. This Court shall retain jurisdiction of this matter and shall consider any motion by any party for the purposes

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of interpreting and enforcing the terms and conditions of this Consent Order. The Defendant agrees that notice of any subsequent proceeding to enforce this Consent Order may be made by mail and waives any requirement of service of process.

2. The Parties to the Consent Order may, by mutual written consent, extend any compliance dates or modify the terms of this Consent Order without leave of this Court. A request for any modification shall be made in writing and submitted to the designated representatives. Any such request shall be made by separate document, and shall not be submitted within any other report or submittal required by this Consent Order. Any such agreed modification shall be in writing and signed by authorized representatives of each party, for filing and incorporation by reference into this Consent Order.

D. Release from Liability

In consideration of the Defendant's payment of a $50,000.00 civil penalty and its commitment to cease and desist as contained in Section III.B.2 above, the Plaintiff releases, waives and discharges the Defendant from any further liability or penalties for the violations of the Act and Board Regulations that were the subject matter of the Complaint herein. The release set forth above does not extend to any matters other than those expressly specified in Plaintiff's Complaint filed on April 3, 2015. The Plaintiff reserves, and this Consent Order is without prejudice to, all rights of the State of Illinois against the Defendant with respect to all other matters, including but not limited to the following:

a. criminal liability;

b. liability for future violations;

c. liability for natural resources damage arising out of the alleged violations; and

d. the Defendant's failure to satisfy the requirements of this Consent Order.

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Nothing in this Consent Order is intended as a waiver, discharge, release, or covenant not to sue for any claim or cause of action, administrative or judicial, civil or criminal, past or future, in law or in equity, which the State of Illinois may have against any person, as defined by Section 3.315 of the Act, 415 ILCS 5/3.315 (2014), other than the Defendant.

E. Execution and Entry of Consent Order

This Order shall become effective only when executed by all Parties to the Consent Order and the Court. This Order may be executed by the parties in one or more counterparts, all of which taken together shall constitute one and the same instrument. The undersigned representatives for each party certify that they are fully authorized by the party whom they represent to enter into the terms and conditions of this Consent Order and to legally bind them to it.

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WHEREFORE, the parties, by their representatives, enter into this Consent Order and submit it to this Court that it may be approved and entered.

AGREED:

FOR THE PLAINTIFF:

PEOPLE OF THE STATE OF ILLINOIS
ex rel. LISA MADIGAN
Attorney General of the
State of Illinois

MATTHEW J. DUNN, Chief
Environmental Enforcement/
Asbestos Litigation Division

BY: Elizabeth Wallace
ELIZABETH WALLACE, Chief
Assistant Attorney General
Environmental Bureau

DATE: 9/14/15

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

LISA BONNETT, Director
Illinois Environmental Protection Agency

BY: _____
JOHN J. KIM
Chief Legal Counsel

DATE: 9/10/15

ED_002192_00004064-00008

FOR THE DEFENDANT:

STERIGENICS U.S., LLC

BY: KAHoOman

Its: SVP - Global EH&S

DATE: 08-Sept-2015

ENTERED:

JUDGE

DATE: 9-18-15

People v. Sterigenics U.S. LLC, 15 CH 651

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-2829
PAT QUINN, GOVERNOR LISA BONNETT, DIRECTOR

TDD 217/782-9143

VN 08

NOV 12 2013

Certified Mail # 7009 3410 0002 3750 1640
Return Receipt Requested

Kevin Wagner
Sterigenics US LLC
7775 Quincy Street
Willowbrook, Illinois 60527

RE: Violation Notice M-2013-03005
I.D. 043110AAC

Dear Mr. Wagner:

This constitutes a Violation Notice pursuant to Section 31(a)(1) of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/31(a)(1), and is based upon a review of available information and an investigation by representatives of the Illinois Environmental Protection Agency ("Illinois EPA").

The Illinois EPA hereby provides notice of alleged violations of environmental laws, regulations, or permits as set forth in Attachments A and B to this letter. Attachments A and B include an explanation of the activities that the Illinois EPA believes may resolve the specified alleged violations, including an estimate of a reasonable time period to complete the necessary activities. Due to the nature and seriousness of the alleged violations, please be advised that resolution of the violations may also require the involvement of a prosecutorial authority for purposes that may include, among others, the imposition of statutory penalties.

A written response, which may include a request for a meeting with representatives of the Illinois EPA, must be submitted via certified mail to the Illinois EPA within 45 days of receipt of this letter. If a meeting is requested, it shall be held within 60 days of receipt of this notice. The response must include information in rebuttal, explanation, or justification of each alleged violation and a statement indicating whether or not the source wishes to enter into a Compliance Commitment Agreement ("CCA") pursuant to Section 31(a) of the Act. If the source wishes to enter into a CCA, the written response must also include proposed terms for the CCA that contains dates for achieving each commitment and may also include a statement that compliance has been achieved for some or all of the alleged violations. In order to increase the likelihood of the Illinois EPA accepting such terms, the written response should specifically propose them in a manner that can be formalized into an enforceable agreement between the Illinois EPA and the source. As such, proposed conditions should be as detailed as possible, including steps to be taken to achieve compliance, the manner of compliance, interim and completion dates, etc.

DIVISION OF RECORDS MANAGEMENT
RELEASABLE
FEB 05 2014
REVIEWER: MJK

4302 N. Main St., Rockford, IL 61103 (815) 987-7760
595 S. State, Elgin, IL 60123 (847) 608-3131
2125 S. First St., Champaign, IL 61820 (217) 278-5800
2009 Mall St., Collinsville, IL 62234 (618) 346-5120

9511 Harrison St., Des Plaines, IL 60016 (847) 294-4000
5407 N. University St., Arbor 113, Peoria, IL 61614 (309) 693-5462
2309 W. Main St., Suite 116, Marion, IL 62959 (618) 993-7200
100 W. Randolph, Suite 10-300, Chicago, IL 60601 (312) 814-6026

PLEASE PRINT ON RECYCLED PAPER

The Illinois EPA will review the proposed terms for a CCA provided by the source and, within 30 days of receipt, will respond with either a proposed CCA or a notice that no CCA will be issued by the Illinois EPA. If the Illinois EPA sends a proposed CCA, the source must respond in writing by either agreeing to and signing the proposed CCA or by notifying the Illinois EPA that the source rejects the terms of the proposed CCA.

If a timely written response to this Violation Notice is not provided, it shall be considered a waiver of the opportunity to respond and meet, and the Illinois EPA may proceed with referral to the prosecutorial authority.

Written communications should be directed to JOHN REKESIUS, Illinois EPA, Bureau of Air, Compliance Unit, P.O. Box 19276, Springfield, Illinois 62794-9276. All communications must include reference to the Violation Notice number in this matter.

Questions regarding the violations identified in Attachment A should be directed to ROMAN DABROS or GEORGE ORDIJA at 847/294-4000.

Questions regarding the violations identified in Attachment B should be directed to Cathy Siders at (217) 524-6308.

Sincerely,

Raymond E. Pilapil, Manager
Compliance Section
Bureau of Air

REP:jr

ATTACHMENT A

Per observations by Roman Dabros and George Ordija on October 23, 2013, and other available information:

VIOLATIONS:

1. Section 9(a) of the Act and 35 Ill. Adm. Code 201.141: Sterigenics US LLC caused, threatened, or allowed the discharge of ethylene oxide into the atmosphere from Sterilization Chamber B, so as to cause or tend to cause air pollution.

2. Section 39.5(6)(a) of the Act and condition 7.1.3(d) of Clean Air Act Permit Program ("CAAPP") permit 95120085: Sterigenics US LLC failed to remove Sterilization Chamber B from sterilization service or taking other action so that excess emissions cease.

3. Sections 9(a), 9.1(d), and 39.5(6)(a) of the Act, 40 CFR 63.362(c), and conditions 7.1.3(b) and 7.1.6(c)(i) of CAAPP permit 95120085: Sterigenics US LLC failed to reduce ethylene oxide emissions from Sterilization Chamber B by at least 99 percent during the October 20, 2013, event.

4. Sections 9(a) and 39.5(6)(a) of the Act, 35 Ill. Adm. Code 218.986(a), and condition 7.1.3(d)(i) of CAAPP permit 95120085: Sterigenics US LLC failed to achieve an overall reduction in uncontrolled VOM emissions from Sterilization Chamber B of at least 81 percent during October 20, 2013, event.

RECOMMENDATIONS:

The Illinois EPA suggests that Sterigenics US LLC take the following action to address the violations stated above:

> Within 45 days of receipt of this Violation Notice, develop, implement, and submit to the Illinois EPA, Bureau of Air, Compliance Section, internal procedures which ensure that ethylene oxide emissions from the sterilization units will comply with the requirements of 40 CFR 63.362(c), 35 Ill. Admin. Code 218.986(a), and not cause or tend to cause air pollution.

Attachment B

On October 16, 2013, an ethylene glycol solution was discharging into stormwater ponds located near 600 Joliet Rd. in Willowbrook (DuPage County). The discharge was traced back to a stormwater roof drainage line at Sterigenics located at 7775 S. Quincy St. in Willowbrook. During the inspection it was noted that ethylene glycol, process wastewater was seeping into the roof drainage line from contaminated groundwater.

Unpermitted Discharge
Implement necessary actions to prevent any further discharges. Apply for and obtain an NPDES Permit from the Illinois EPA for the discharge or submit appropriate documentation that the discharge has been permanently eliminated and a permit is no longer required. Compliance is expected immediately.

Violation Date	Violation Description
10/16/2013 – present	Except as in compliance with the provisions of the Act, Board regulations, and the CWA (Clean Water Act), and the provisions and conditions of the NPDES (National Pollutant Discharge Elimination System) permit issued to the discharger, the discharge of any contaminant or pollutant by any person into the waters of the State from a point source shall be unlawful.
Rule/Reg:	Section 12(a), (d), and (f) of the Act, 415 ILCS5/12(a), (d), and (f) (2012), 35 Ill. Adm. Code 302.203, and 309.102(a)

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IN THE CIRCUIT COURT OF THE EIGHTEENTH JUDICIAL CIRCUIT
DUPAGE COUNTY, ILLINOIS
CHANCERY DIVISION

FILED
2015 SEP 18 AM 9:21

PEOPLE OF THE STATE OF ILLINOIS, *ex rel.* LISA MADIGAN, Attorney General of the State of Illinois,	)	
Plaintiff,	)	
v.	)	No. 2015 CH 651
STERIGENICS U.S., LLC, a Delaware limited liability company,	)	
Defendant.	)	

CASE CLOSED
JUDGE'S INIT.

CONSENT ORDER

Plaintiff, PEOPLE OF THE STATE OF ILLINOIS, *ex rel.* LISA MADIGAN, Attorney General of the State of Illinois, the Illinois Environmental Protection Agency ("Illinois EPA"), and Defendant, STERIGENICS U.S., LLC, (collectively, "Parties to the Consent Order") have agreed to the making of this Consent Order and submit it to this Court for approval.

I. INTRODUCTION

This stipulation of facts is made and agreed upon for purposes of settlement only and as a factual basis for the Court's entry of the Consent Order and issuance of any injunctive relief. None of the facts stipulated herein shall be introduced into evidence in any other proceeding regarding the violations of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/1 *et seq.* (2014), and the Illinois Pollution Control Board ("Board") Regulations, alleged in the Complaint except as otherwise provided herein. It is the intent of the parties to this Consent Order that it be a final judgment on the merits of this matter.

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A. Parties

1. On April 3, 2015, a Complaint was filed on behalf of the People of the State of Illinois by Lisa Madigan, Attorney General of the State of Illinois, on her own motion and upon the request of the Illinois EPA, pursuant to Section 42(d) and (e) of the Act, 415 ILCS 5/42(d) and (e) (2014), against the Defendant.

2. The Illinois EPA is an administrative agency of the State of Illinois, created pursuant to Section 4 of the Act, 415 ILCS 5/4 (2014).

3. At all times relevant to the Complaint, Defendant Sterigenics U.S., LLC was, and is, a Delaware limited liability company, and operated a gaseous sterilization business located at 7775 Quincy Street, Willowbrook, DuPage County, Illinois ("Facility" or "Site").

4. The Defendant's sterilization process uses ethylene oxide, a hazardous air pollutant, and generates ethylene glycol and other chemicals.

5. Plaintiff has alleged that, on or about October 7, 2013, the Defendant released ethylene glycol into soil and groundwater at, and in the vicinity of, the Site.

6. On October 21, 2013, the Defendant reported the uncontrolled release of 30 pounds of ethylene oxide gas to the atmosphere. The Defendant subsequently revised its estimate of the quantity of ethylene oxide released to approximately 12 pounds.

B. Allegations of Non-Compliance

Plaintiff contends that the Defendant has violated the following provisions of the Act and Board Regulations:

Count I: WATER POLLUTION, violation of 415 ILCS 5/12(a) (2014);

Count II: CREATING A WATER POLLUTION HAZARD, violation of 415

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ILCS 5/12(d) (2014);

Count III: VIOLATION OF GENERAL USE WATER QUALITY STANDARDS, 415 ILCS 5/9(a) (2014), and 35 Ill. Adm. Code 302.203;

Count IV: NPDES PERMIT VIOLATION, 415 ILCS 5/12(f) (2014), and 35 Ill. Adm. Code 309.102;

Count V: AIR POLLUTION, violation of 415 ILCS 5/9(a) (2014) and 35 Ill. Adm. Code 201.141;

Count VI: VIOLATION OF CAAPP PERMIT CONDITIONS: FAILURE TO COMPLY WITH NESHAP EMISSION STANDARDS, 415 ILCS 5/9.1(d) (2014), 415 ILCS 5/39.5(6) (2014), 40 CFR 63.362(a), and Conditions 7.1.6(c)(1) and 7.1.3(b)(ii) of CAAPP Permit No. 95120085;

Count VII: VIOLATION OF CAAPP PERMIT CONDITIONS: FAILURE TO COMPLY WITH EMISSION LIMITATIONS FOR THE CHICAGO AREA, 415 ILCS 5/9(a) (2014), 415 ILCS 5/39.5(6) (2014), 35 Ill. Adm. Code 218.986(a), and Condition 7.1.3(d)(i) of CAAPP Permit No. 95120085.

C. Non-Admission of Violations

The Defendant represents that it has entered into this Consent Order for the purpose of settling and compromising disputed claims without having to incur the expense of contested litigation. By entering into this Consent Order and complying with its terms, the Defendant does not affirmatively admit the allegations of violation within the Complaint and referenced above, and this Consent Order shall not be interpreted as including such admission.

D. Compliance Activities to Date

1. On January 13, 2014, the Defendant applied to enter its Facility into Illinois EPA's voluntary Site Remediation Program ("SRP") to address remediation of the release of ethylene glycol, propylene glycol and sulfate from the Facility. The Facility remediation project

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was designated under the SRP as the "Sterigenics US LLC site, LPC No. 0431105032" ("On Site SRP").

2. On November 18, 2014, Illinois EPA issued a No Further Remediation letter ("NFR letter") to the Defendant for the work performed under the On-Site SRP. The Defendant recorded the NFR letter for the On-Site SRP with the office of the DuPage County Recorder on December 5, 2014.

3. On July 13, 2014, the Defendant applied to enter off-site areas which were affected, or potentially affected, by the release of ethylene glycol, propylene glycol, and sulfate into the SRP. The off-site remediation project has been designated by Illinois EPA as the "Willowbrook Centre Joint Venture, LPC No. 0431105077" ("Off-Site SRP").

4. On May 29, 2015, Illinois EPA issued an NFR letter to the Defendant for work performed under the Off-Site SRP. The Defendant recorded the NFR letter for the Off-Site SRP with the office of the DuPage County Recorder on July 6, 2015.

II. APPLICABILITY

This Consent Order shall apply to and be binding upon the Parties to the Consent Order. The Defendant waives as a defense to any enforcement action taken pursuant to this Consent Order the failure of any of its officers, directors, agents, employees or successors or assigns to take such action as shall be required to comply with the provisions of this Consent Order. This Consent Order may be used against the Defendant in any subsequent enforcement action or permit proceeding as proof of a past adjudication of violation of the Act and the Board Regulations for all violations alleged in the Complaint in this matter, for purposes of Sections 39 and 42 of the Act, 415 ILCS 5/39 and 42 (2014).

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III. JUDGMENT ORDER

This Court has jurisdiction of the subject matter herein and of the Parties to the Consent Order and, having considered the stipulated facts and being advised in the premises, finds the following relief appropriate:

IT IS HEREBY ORDERED, ADJUDGED AND DECREED:

A. Civil Penalty

1. The Defendant shall pay a civil penalty of Fifty Thousand Dollars ($50,000.00). Payment shall be tendered at time of entry of the Consent Order.

2. The civil penalty payment shall be made by certified check or money order payable to the Illinois EPA for deposit into the Environmental Protection Trust Fund ("EPTF").

3. The case name and case number shall appear on the face of the certified check or money order.

B. Future Compliance

1. The Defendant shall comply with the terms and conditions of its Clean Air Act Permit Program ("CAAPP) Permit.

2. This Consent Order in no way affects the responsibilities of the Defendant to comply with any other federal, state or local laws or regulations, including but not limited to the Act and the Board Regulations.

3. The Defendant shall cease and desist from future violations of the Act and Board Regulations that were the subject matter of the Complaint.

C. Enforcement and Modification of Consent Order

1. This Consent Order is a binding and enforceable order of this Court. This Court shall retain jurisdiction of this matter and shall consider any motion by any party for the purposes

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of interpreting and enforcing the terms and conditions of this Consent Order. The Defendant agrees that notice of any subsequent proceeding to enforce this Consent Order may be made by mail and waives any requirement of service of process.

2. The Parties to the Consent Order may, by mutual written consent, extend any compliance dates or modify the terms of this Consent Order without leave of this Court. A request for any modification shall be made in writing and submitted to the designated representatives. Any such request shall be made by separate document, and shall not be submitted within any other report or submittal required by this Consent Order. Any such agreed modification shall be in writing and signed by authorized representatives of each party, for filing and incorporation by reference into this Consent Order.

D. Release from Liability

In consideration of the Defendant's payment of a $50,000.00 civil penalty and its commitment to cease and desist as contained in Section III.B.2 above, the Plaintiff releases, waives and discharges the Defendant from any further liability or penalties for the violations of the Act and Board Regulations that were the subject matter of the Complaint herein. The release set forth above does not extend to any matters other than those expressly specified in Plaintiff's Complaint filed on April 3, 2015. The Plaintiff reserves, and this Consent Order is without prejudice to, all rights of the State of Illinois against the Defendant with respect to all other matters, including but not limited to the following:

a. criminal liability;

b. liability for future violations;

c. liability for natural resources damage arising out of the alleged violations; and

d. the Defendant's failure to satisfy the requirements of this Consent Order.

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Nothing in this Consent Order is intended as a waiver, discharge, release, or covenant not to sue for any claim or cause of action, administrative or judicial, civil or criminal, past or future, in law or in equity, which the State of Illinois may have against any person, as defined by Section 3.315 of the Act, 415 ILCS 5/3.315 (2014), other than the Defendant.

E. Execution and Entry of Consent Order

This Order shall become effective only when executed by all Parties to the Consent Order and the Court. This Order may be executed by the parties in one or more counterparts, all of which taken together shall constitute one and the same instrument. The undersigned representatives for each party certify that they are fully authorized by the party whom they represent to enter into the terms and conditions of this Consent Order and to legally bind them to it.

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WHEREFORE, the parties, by their representatives, enter into this Consent Order and submit it to this Court that it may be approved and entered.

AGREED:

FOR THE PLAINTIFF:

PEOPLE OF THE STATE OF ILLINOIS
ex rel. LISA MADIGAN
Attorney General of the
State of Illinois

MATTHEW J. DUNN, Chief
Environmental Enforcement/
Asbestos Litigation Division

BY: Elizabeth Wallace
ELIZABETH WALLACE, Chief
Assistant Attorney General
Environmental Bureau

DATE: 9/14/15

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

LISA BONNETT, Director
Illinois Environmental Protection Agency

BY: _____
JOHN J. KIM
Chief Legal Counsel

DATE: 9/10/15

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FOR THE DEFENDANT:

STERIGENICS U.S., LLC

BY: KAHoOman

Its: SVP - Global EH&S

DATE: 08-Sept-2015

ENTERED:

JUDGE

DATE: 9-18-15

People v. Sterigenics U.S. LLC, 15 CH 651

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-2829
PAT QUINN, GOVERNOR LISA BONNETT, DIRECTOR

VN 08

TDD 217/782-9143

NOV 12 2013

Certified Mail # 7009 3410 0002 3750 1640
Return Receipt Requested

Kevin Wagner
Sterigenics US LLC
7775 Quincy Street
Willowbrook, Illinois 60527

RE: Violation Notice M-2013-03005
I.D. 043110AAC

Dear Mr. Wagner:

This constitutes a Violation Notice pursuant to Section 31(a)(1) of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/31(a)(1), and is based upon a review of available information and an investigation by representatives of the Illinois Environmental Protection Agency ("Illinois EPA").

The Illinois EPA hereby provides notice of alleged violations of environmental laws, regulations, or permits as set forth in Attachments A and B to this letter. Attachments A and B include an explanation of the activities that the Illinois EPA believes may resolve the specified alleged violations, including an estimate of a reasonable time period to complete the necessary activities. Due to the nature and seriousness of the alleged violations, please be advised that resolution of the violations may also require the involvement of a prosecutorial authority for purposes that may include, among others, the imposition of statutory penalties.

A written response, which may include a request for a meeting with representatives of the Illinois EPA, must be submitted via certified mail to the Illinois EPA within 45 days of receipt of this letter. If a meeting is requested, it shall be held within 60 days of receipt of this notice. The response must include information in rebuttal, explanation, or justification of each alleged violation and a statement indicating whether or not the source wishes to enter into a Compliance Commitment Agreement ("CCA") pursuant to Section 31(a) of the Act. If the source wishes to enter into a CCA, the written response must also include proposed terms for the CCA that contains dates for achieving each commitment and may also include a statement that compliance has been achieved for some or all of the alleged violations. In order to increase the likelihood of the Illinois EPA accepting such terms, the written response should specifically propose them in a manner that can be formalized into an enforceable agreement between the Illinois EPA and the source. As such, proposed conditions should be as detailed as possible, including steps to be taken to achieve compliance, the manner of compliance, interim and completion dates, etc.

DIVISION OF RECORDS MANAGEMENT
RELEASABLE
FEB 05 2014
REVIEWER: MJK

4302 N. Main St., Rockford, IL 61103 (815) 987-7760
595 S. State, Elgin, IL 60123 (847) 608-3131
2125 S. First St., Champaign, IL 61820 (217) 278-5800
2009 Mall St., Collinsville, IL 62234 (618) 346-5120

9511 Harrison St., Des Plaines, IL 60016 (847) 294-4000
5407 N. University St., Arbor 113, Peoria, IL 61614 (309) 693-5462
2309 W. Main St., Suite 116, Marion, IL 62959 (618) 993-7200
100 W. Randolph, Suite 10-300, Chicago, IL 60601 (312) 814-6026

PLEASE PRINT ON RECYCLED PAPER

The Illinois EPA will review the proposed terms for a CCA provided by the source and, within 30 days of receipt, will respond with either a proposed CCA or a notice that no CCA will be issued by the Illinois EPA. If the Illinois EPA sends a proposed CCA, the source must respond in writing by either agreeing to and signing the proposed CCA or by notifying the Illinois EPA that the source rejects the terms of the proposed CCA.

If a timely written response to this Violation Notice is not provided, it shall be considered a waiver of the opportunity to respond and meet, and the Illinois EPA may proceed with referral to the prosecutorial authority.

Written communications should be directed to JOHN REKESIUS, Illinois EPA, Bureau of Air, Compliance Unit, P.O. Box 19276, Springfield, Illinois 62794-9276. All communications must include reference to the Violation Notice number in this matter.

Questions regarding the violations identified in Attachment A should be directed to ROMAN DABROS or GEORGE ORDIJA at 847/294-4000.

Questions regarding the violations identified in Attachment B should be directed to Cathy Siders at (217) 524-6308.

Sincerely,

Raymond E. Pilapil, Manager
Compliance Section
Bureau of Air

REP:jr

ATTACHMENT A

Per observations by Roman Dabros and George Ordija on October 23, 2013, and other available information:

VIOLATIONS:

1. Section 9(a) of the Act and 35 Ill. Adm. Code 201.141: Sterigenics US LLC caused, threatened, or allowed the discharge of ethylene oxide into the atmosphere from Sterilization Chamber B, so as to cause or tend to cause air pollution.

2. Section 39.5(6)(a) of the Act and condition 7.1.3(d) of Clean Air Act Permit Program ("CAAPP") permit 95120085: Sterigenics US LLC failed to remove Sterilization Chamber B from sterilization service or taking other action so that excess emissions cease.

3. Sections 9(a), 9.1(d), and 39.5(6)(a) of the Act, 40 CFR 63.362(c), and conditions 7.1.3(b) and 7.1.6(c)(i) of CAAPP permit 95120085: Sterigenics US LLC failed to reduce ethylene oxide emissions from Sterilization Chamber B by at least 99 percent during the October 20, 2013, event.

4. Sections 9(a) and 39.5(6)(a) of the Act, 35 Ill. Adm. Code 218.986(a), and condition 7.1.3(d)(i) of CAAPP permit 95120085: Sterigenics US LLC failed to achieve an overall reduction in uncontrolled VOM emissions from Sterilization Chamber B of at least 81 percent during October 20, 2013, event.

RECOMMENDATIONS:

The Illinois EPA suggests that Sterigenics US LLC take the following action to address the violations stated above:

> Within 45 days of receipt of this Violation Notice, develop, implement, and submit to the Illinois EPA, Bureau of Air, Compliance Section, internal procedures which ensure that ethylene oxide emissions from the sterilization units will comply with the requirements of 40 CFR 63.362(c), 35 Ill. Admin. Code 218.986(a), and not cause or tend to cause air pollution.

Attachment B

On October 16, 2013, an ethylene glycol solution was discharging into stormwater ponds located near 600 Joliet Rd. in Willowbrook (DuPage County). The discharge was traced back to a stormwater roof drainage line at Sterigenics located at 7775 S. Quincy St. in Willowbrook. During the inspection it was noted that ethylene glycol, process wastewater was seeping into the roof drainage line from contaminated groundwater.

Unpermitted Discharge
Implement necessary actions to prevent any further discharges. Apply for and obtain an NPDES Permit from the Illinois EPA for the discharge or submit appropriate documentation that the discharge has been permanently eliminated and a permit is no longer required. Compliance is expected immediately.

Violation Date	Violation Description
10/16/2013 – present	Except as in compliance with the provisions of the Act, Board regulations, and the CWA (Clean Water Act), and the provisions and conditions of the NPDES (National Pollutant Discharge Elimination System) permit issued to the discharger, the discharge of any contaminant or pollutant by any person into the waters of the State from a point source shall be unlawful.
Rule/Reg:	Section 12(a), (d), and (f) of the Act, 415 ILCS5/12(a), (d), and (f) (2012), 35 Ill. Adm. Code 302.203, and 309.102(a)

Attention:

Sterigenics US LLC
Attn: Kevin Wagner
2015 Spring Road, Suite 650
Oak Brook, Illinois 60521

State of Illinois

CLEAN AIR ACT PERMIT PROGRAM (CAAPP) PERMIT

Source:

Sterigenics US LLC
7775 Quincy Street
Willowbrook, Illinois 60521

I.D. No.: 043110AAC
Permit No.: 95120085

Permitting Authority:

Illinois Environmental Protection Agency
Bureau of Air, Permit Section
217/785-1705

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-2829
BRUCE RAUNER, GOVERNOR LISA BONNETT, DIRECTOR

CLEAN AIR ACT PERMIT PROGRAM (CAAPP) PERMIT

Type of Application:	Renewal
Purpose of Application:	Renew Existing CAAPP Permit for 5 Years
ID No.:	043110AAC
Permit No.:	95120085
Statement of Basis No.:	95120085-0415
Date Application Received:	March 25, 2011
Date Issued:	June 8, 2015
Expiration Date:	June 8, 2020
Renewal Submittal Date:	9 Months Prior to June 8, 2020
Source Name:	Sterigenics US, LLC
Address:	7775 Quincy Street
City:	Willowbrook
County:	DuPage
ZIP Code:	60521

This permit is hereby granted to the above-designated source authorizing operation in accordance with this CAAPP permit, pursuant to the above referenced application. This source is subject to the conditions contained herein. For further information on the source see Section 1 and for further discussion on the effectiveness of this permit see Condition 2.3(g).

If you have any questions concerning this permit, please contact Brandon Nolen at 217/785-1705.

Raymond E. Pilapil
Acting Manager, Permit Section
Division of Air Pollution Control

REP:MTR:BMN:psj

cc: IEPA, Permit Section
IEPA, FOS, Region 1
Lotus Notes Database

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Section 1 - Source Information

1. Addresses

Source

Sterigenics US LLC
7775 Quincy Street
Willowbrook, Illinois 60521

Owner

Sterigenics US LLC
2015 Spring Road, Suite 450
Oak Brook, Illinois 60523

Operator

Sterigenics US1 LLC
7775 Quincy Street
Willowbrook, Illinois 60521

Permittee

The Owner or Operator of the source as identified in this table.

2. Contacts

Certified Officials

The source shall submit an Administrative Permit Amendment for any change in the Certified Officials, pursuant to Section 39.5(13) of the Act.

	Name	*Title*
Responsible Official	Kathleen Hoffman	Vice President
Delegated Authority	No other individuals have been authorized by the IEPA.	N/A

Other Contacts

	Name	*Phone No.*	*Email*
Source Contact	Kevin Wagner	630-928-1771	kwagner@sterigenics.com
Technical Contact	Kevin Wagner	630-928-1771	kwagner@sterigenics.com
Correspondence	Kevin Wagner	630-928-1771	kwagner@sterigenics.com
Billing	Kevin Wagner	630-928-1771	kwagner@sterigenics.com

3. Single Source

The source identified in Condition 1.1 above shall be defined to include all the following additional source(s):

I.D. No.	*Permit No.*	*Single Source Name and Address*
N/A	N/A	N/A

Section 2 - General Permit Requirements

1. Prohibitions

a. It shall be unlawful for any person to violate any terms or conditions of this permit issued under Section 39.5 of the Act, to operate the CAAPP source except in compliance with this permit issued by the IEPA under Section 39.5 of the Act or to violate any other applicable requirements. All terms and conditions of this permit issued under Section 39.5 of the Act are enforceable by USEPA and citizens under the Clean Air Act, except those, if any, that are specifically designated as not being federally enforceable in this permit pursuant to Section 39.5(7)(m) of the Act. [Section 39.5(6)(a) of the Act]

b. After the applicable CAAPP permit or renewal application submittal date, as specified in Section 39.5(5) of the Act, the source shall not operate this CAAPP source without a CAAPP permit unless the complete CAAPP permit or renewal application for such source has been timely submitted to the IEPA. [Section 39.5(6)(b) of the Act]

c. No Owner or Operator of the CAAPP source shall cause or threaten or allow the continued operation of an emission source during malfunction or breakdown of the emission source or related air pollution control equipment if such operation would cause a violation of the standards or limitations applicable to the source, unless this CAAPP permit granted to the source provides for such operation consistent with the Act and applicable Illinois Pollution Control Board regulations. [Section 39.5(6)(c) of the Act]

d. Pursuant to Section 39.5(7)(g) of the Act, emissions from the source are not allowed to exceed any allowances that the source lawfully holds under Title IV of the Clean Air Act or the regulations promulgated thereunder, consistent with Section 39.5(17) of the Act and applicable requirements, if any.

2. Emergency Provisions

Pursuant to Section 39.5(7)(k) of the Act, the Owner or Operator of the CAAPP source may provide an affirmative defense of emergency to an action brought for noncompliance with technology-based emission limitations under this CAAPP permit if the following conditions are met through properly signed, contemporaneous operating logs, or other relevant evidence:

a. i. An emergency occurred and the source can identify the cause(s) of the emergency.

ii. The source was at the time being properly operated.

iii. The source submitted notice of the emergency to the IEPA within 2 working days of the time when emission limitations were exceeded due to the emergency. This notice must contain a detailed description of the emergency, any steps taken to mitigate emissions, and corrective actions taken.

iv. During the period of the emergency the source took all reasonable steps to minimize levels of emissions that exceeded the emission limitations, standards, or requirements in this permit.

b. For purposes of Section 39.5(7)(k) of the Act, "emergency" means any situation arising from sudden and reasonably unforeseeable events beyond the control of the source, such as an act of God, that requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under this permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventive maintenance, careless or improper operation, or operation error.

c. In any enforcement proceeding, the source seeking to establish the occurrence of an emergency has the burden of proof. This provision is in addition to any emergency or

upset provision contained in any applicable requirement. This provision does not relieve the source of any reporting obligations under existing federal or state laws or regulations.

3. General Provisions

a. Duty to Comply

The source must comply with all terms and conditions of this permit. Any permit noncompliance constitutes a violation of the CAA and the Act, and is grounds for any or all of the following: enforcement action; permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. [Section 39.5(7)(o)(i) of the Act]

b. Need to Halt or Reduce Activity is not a Defense

It shall not be a defense for the source in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. [Section 39.5(7)(o)(ii) of the Act]

c. Duty to Maintain Equipment

The source shall maintain all equipment covered under this permit in such a manner that the performance or operation of such equipment shall not cause a violation of applicable requirements. [Section 39.5(7)(a) of the Act]

d. Disposal Operations

The source shall be operated in such a manner that the disposal of air contaminants collected by the equipment operations, or activities shall not cause a violation of the Act or regulations promulgated there under. [Section 39.5(7)(a) of the Act]

e. Duty to Pay Fees

i. The source must pay fees to the IEPA consistent with the fee schedule approved pursuant to Section 39.5(18) of the Act, and submit any information relevant thereto. [Section 39.5(7)(o)(vi) of the Act]

ii. The IEPA shall assess annual fees based on the allowable emissions of all regulated air pollutants, except for those regulated air pollutants excluded in Section 39.5(18)(f) of the Act and insignificant activities in Section 6, at the source during the term of this permit. The amount of such fee shall be based on the information supplied by the applicant in its complete CAAPP permit application. [Section 39.5(18)(a)(ii)(A) of the Act]

iii. The check should be payable to "Treasurer, State of Illinois" and sent to: Fiscal Services Section, Illinois EPA, P.O. Box 19276, Springfield, IL, 62794-9276. Include on the check: ID #, Permit #, and "CAAPP Operating Permit Fees". [Section 39.5(18)(e) of the Act]

f. Obligation to Allow IEPA Surveillance

Pursuant to Sections 4(a), 39.5(7)(a), and 39.5(7)(p)(ii) of the Act, inspection and entry requirements that necessitate that, upon presentation of credentials and other documents as may be required by law and in accordance with constitutional limitations, the source shall allow the IEPA, or an authorized representative to perform the following:

i. Enter upon the source's premises where the emission unit(s) are located or emissions-related activity is conducted, or where records must be kept under the conditions of this permit.

ii. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit.

iii. Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit.

iv. Sample or monitor any substances or parameters at any location at reasonable times:

A. As authorized by the Clean Air Act or the Act, at reasonable times, for the purposes of assuring compliance with this CAAPP permit or applicable requirements; or

B. As otherwise authorized by the Act.

v. Enter and utilize any photographic, recording, testing, monitoring, or other equipment for the purposes of preserving, testing, monitoring, or recording any activity, discharge or emission at the source authorized by this permit.

g. **Effect of Permit**

i. Pursuant to Section 39.5(7)(j)(iv) of the Act, nothing in this CAAPP permit shall alter or affect the following:

A. The provisions of Section 303 (emergency powers) of the CAA, including USEPA's authority under that Section.

B. The liability of the Owner or Operator of the source for any violation of applicable requirements prior to or at the time of permit issuance.

C. The applicable requirements of the acid rain program consistent with Section 408(a) of the Clean Air Act.

D. The ability of USEPA to obtain information from the source pursuant to Section 114 (inspections, monitoring, and entry) of the Clean Air Act.

ii. Notwithstanding the conditions of this permit specifying compliance practices for applicable requirements, pursuant to Sections 39.5(7)(j) and (p) of the Act, any person (including the Permittee) may also use other credible evidence to establish compliance or noncompliance with applicable requirements. [35 IAC 201.122 and Section 39.5(7)(a) of the Act]

h. **Severability Clause**

The provisions of this permit are severable. In the event of a challenge to any portion of this permit, other portions of this permit may continue to be in effect. Should any portion of this permit be determined to be illegal or unenforceable, the validity of the other provisions shall not be affected and the rights and obligations of the source shall be construed and enforced as if this permit did not contain the particular provisions held to be invalid and the applicable requirements underlying these provisions shall remain in force. [Section 39.5(7)(i) of the Act]

4. Testing

a. Tests conducted to measure composition of materials, efficiency of pollution control devices, emissions from process or control equipment, or other parameters shall be conducted using standard test methods if applicable test methods are not specified by the applicable regulations or otherwise identified in the conditions of this permit. Documentation of the test date, conditions, methodologies, calculations, and test results shall be retained pursuant to the recordkeeping procedures of this permit. Reports of

any tests conducted as required by this permit or as the result of a request by the IEPA shall be submitted as specified in Condition 7.1 of this permit. [35 IAC Part 201 Subpart J and Section 39.5(7)(a) of the Act]

b. Pursuant to Section 4(b) of the Act and 35 IAC 201.282, every emission source or air pollution control equipment shall be subject to the following testing requirements for the purpose of determining the nature and quantities of specified air contaminant emissions and for the purpose of determining ground level and ambient air concentrations of such air contaminants:

i. Testing by Owner or Operator: The IEPA may require the Owner or Operator of the emission source or air pollution control equipment to conduct such tests in accordance with procedures adopted by the IEPA, at such reasonable times as may be specified by the IEPA and at the expense of the Owner or Operator of the emission source or air pollution control equipment. All such tests shall be made by or under the direction of a person qualified by training and/or experience in the field of air pollution testing. The IEPA shall have the right to observe all aspects of such tests.

ii. Testing by the IEPA: The IEPA shall have the right to conduct such tests at any time at its own expense. Upon request of the IEPA, the Owner or Operator of the emission source or air pollution control equipment shall provide, without charge to the IEPA, necessary holes in stacks or ducts and other safe and proper testing facilities, including scaffolding, but excluding instruments and sensing devices, as may be necessary.

5. Recordkeeping

a. **Control Equipment Maintenance Records**

Pursuant to Section 39.5(7)(b) of the Act, a maintenance record shall be kept on the premises for each item of air pollution control equipment. At a minimum, this record shall show the dates maintenance was performed and the nature of preventative maintenance activities.

b. **Retention of Records**

i. Records of all monitoring data and support information shall be retained for a period of at least 5 years from the date of the monitoring sample, measurement, report, or application. Support information includes all calibration and maintenance records, original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit. [Section 39.5(7)(e)(ii) of the Act]

ii. Pursuant to Section 39.5(7)(a) of the Act, other records required by this permit including any logs, plans, procedures, or instructions required to be kept by this permit shall be retained for a period of at least 5 years from the date of entry unless a different period is specified by a particular permit provision.

c. **Availability of Records**

i. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall retrieve and provide paper copies, or as electronic media, any records retained in an electronic format (e.g., computer) in response to an IEPA or USEPA request during the course of a source inspection.

ii. Pursuant to Section 39.5(7)(a) of the Act, upon written request by the IEPA for copies of records or reports required to be kept by this permit, the Permittee shall promptly submit a copy of such material to the IEPA. For this purpose, material shall be submitted to the IEPA within 30 days unless additional time is provided by the IEPA or the Permittee believes that the volume and nature of

requested material would make this overly burdensome, in which case, the Permittee shall respond within 30 days with the explanation and a schedule for submittal of the requested material. (See also Condition 2.9(d))

6. Certification

a. **Compliance Certification**

i. Pursuant to Section 39.5(7)(p)(v)(C) of the Act, the source shall submit annual compliance certifications by May 1 unless a different date is specified by an applicable requirement or by a particular permit condition. The annual compliance certifications shall include the following:

A. The identification of each term or condition of this permit that is the basis of the certification.

B. The compliance status.

C. Whether compliance was continuous or intermittent.

D. The method(s) used for determining the compliance status of the source, both currently and over the reporting period consistent with the conditions of this permit.

ii. Pursuant to Section 39.5(7)(p)(v)(D) of the Act, all compliance certifications shall be submitted to the IEPA Compliance Section. Address is included in Attachment 3.

iii. Pursuant to Section 39.5(7)(p)(i) of the Act, all compliance reports required to be submitted shall include a certification in accordance with Condition 2.6(b).

b. **Certification by a Responsible Official**

Any document (including reports) required to be submitted by this permit shall contain a certification by the responsible official of the source that meets the requirements of Section 39.5(5) of the Act and applicable regulations. [Section 39.5(7)(p)(i) of the Act]. An example Certification by a Responsible Official is included in Attachment 4 of this permit.

7. Permit Shield

a. Pursuant to Section 39.5(7)(j) of the Act, except as provided in Condition 2.7(b) below, the source has requested and has been granted a permit shield. This permit shield provides that compliance with the conditions of this permit shall be deemed compliance with applicable requirements which were applicable as of the date the proposed permit for this source was issued, provided that either the applicable requirements are specifically identified within this permit, or the IEPA, in acting on this permit application, has determined that other requirements specifically identified are not applicable to this source and this determination (or a concise summary thereof) is included in this permit. This permit shield does not extend to applicable requirements which are promulgated after April 22, 2015 (date USEPA notice started), unless this permit has been modified to reflect such new requirements.

b. Pursuant to Section 39.5(7)(j) of the Act, this permit and the terms and conditions herein do not affect the Permittee's past and/or continuing obligation with respect to statutory or regulatory requirements governing major source construction or modification under Title I of the CAA. Further, neither the issuance of this permit nor any of the terms or conditions of the permit shall alter or affect the liability of the Permittee for any violation of applicable requirements prior to or at the time of permit issuance.

c. Pursuant to Section 39.5(7)(a) of the Act, the issuance of this permit by the IEPA does not and shall not be construed as barring, diminishing, adjudicating or in any way affecting any currently pending or future legal, administrative or equitable rights or claims, actions, suits, causes of action or demands whatsoever that the IEPA or the USEPA may have against the applicant including, but not limited to, any enforcement action authorized pursuant to the provision of applicable federal and state law.

8. Title I Conditions

Pursuant to Sections 39(a), 39(f), and 39.5(7)(a) of the Act, as generally identified below, this CAAPP permit may contain certain conditions that relate to requirements arising from the construction or modification of emission units at this source. These requirements derive from permitting programs authorized under Title I of the Clean Air Act (CAA) and regulations thereunder, and Title X of the Illinois Environmental Protection Act (Act) and regulations implementing the same. Such requirements, including the New Source Review programs for both major (i.e., PSD and nonattainment areas) and minor sources, are implemented by the IEPA.

a. This permit may contain conditions that reflect requirements originally established in construction permits previously issued for this source. These conditions include requirements from preconstruction permits issued pursuant to regulations approved or promulgated by USEPA under Title I of the CAA, as well as requirements contained within construction permits issued pursuant to state law authority under Title X of the Act. Accordingly, all such conditions are incorporated into this CAAPP permit by virtue of being either an "applicable Clean Air Act requirement" or an "applicable requirement" in accordance with Section 39.5 of the Act. These conditions are identifiable herein by a designation to their origin of authority.

b. This permit may contain conditions that reflect necessary revisions to requirements established for this source in preconstruction permits previously issued under the authority of Title I of the CAA. These conditions are specifically designated herein as "TIR".

   i. Revisions to original Title I permit conditions are incorporated into this permit through the combined legal authority of Title I of the CAA and Title X of the Act. Public participation requirements and appeal rights shall be governed by Section 39.5 of the Act.

   ii. Revised Title I permit conditions shall remain in effect through this CAAPP permit, and are therefore enforceable under the same, so long as such conditions do not expire as a result of a failure to timely submit a complete renewal application or are not removed at the applicant's request.

c. This permit may contain conditions that reflect new requirements for this source that would ordinarily derive from a preconstruction permit established under the authority of Title I of the CAA. These conditions are specifically designated herein as "TIN".

   i. The incorporation of new Title I requirements into this CAAPP permit is authorized through the combined legal authority of Title I of the CAA and Title X of the Act. Public participation requirements and appeal rights shall be governed by Section 39.5 of the Act.

   ii. Any Title I conditions that are newly incorporated shall remain in effect through this CAAPP permit, and are therefore enforceable under the same, so long as such conditions do not expire as a result of a failure to timely submit a complete renewal application or are not removed at the applicant's request.

9. Reopening and Revising Permit

a. **Permit Actions**

This permit may be modified, revoked, reopened and reissued, or terminated for cause in accordance with applicable provisions of Section 39.5 of the Act. The filing of a request by the source for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition. [Section 39.5(7)(o)(iii) of the Act]

b. **Reopening and Revision**

Pursuant to Section 39.5(15)(a) of the Act, this permit must be reopened and revised if any of the following occur:

i. Additional requirements become applicable to the equipment covered by this permit and three or more years remain before expiration of this permit;

ii. Additional requirements become applicable to the source for acid deposition under the acid rain program;

iii. The IEPA or USEPA determines that this permit contains a material mistake or that an inaccurate statement was made in establishing the emission standards or limitations, or other terms or conditions of this permit; or

iv. The IEPA or USEPA determines that this permit must be revised or revoked to ensure compliance with the applicable requirements.

c. **Inaccurate Application**

Pursuant to Sections 39.5(5)(e) and (i) of the Act, the IEPA has issued this permit based upon the information submitted by the source in the permit application referenced on page 1 of this permit. Any misinformation, false statement or misrepresentation in the application shall be grounds for revocation or reopening of this CAAPP under Section 39.5(15) of the Act.

d. **Duty to Provide Information**

The source shall furnish to the IEPA, within a reasonable time specified by the IEPA any information that the IEPA may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. Upon request, the source shall also furnish to the IEPA copies of records required to be kept by this permit. [Section 39.5(7)(o)(v) of the Act]

10. Emissions Trading Programs

No permit revision shall be required for increases in emissions allowed under any USEPA approved economic incentives, marketable permits, emissions trading, and other similar programs or processes for changes that are provided for elsewhere in this permit and that are authorized by the applicable requirement. [Section 39.5(7)(o)(vii) of the Act]

11. Permit Renewal

a. Upon the expiration of this permit, if the source is operated, it shall be deemed to be operating without a permit unless a timely and complete CAAPP application has been submitted for renewal of this permit. However, if a timely and complete application to renew this CAAPP permit has been submitted, the terms and all conditions of the most recent issued CAAPP permit will remain in effect until the issuance of a renewal permit. [Sections 39.5(5)(l) and (o) of the Act]

b. For purposes of permit renewal, a timely application is one that is submitted no less than 9 months prior to the date of permit expiration. [Section 39.5(5)(n) of the Act]

12. Permanent Shutdown

Pursuant to Section 39.5(7)(a) of the Act, this permit only covers emission units and control equipment while physically present at the source location(s). Unless this permit specifically provides for equipment relocation, this permit is void for the operation or activity of any item of equipment on the date it is removed from the permitted location(s) or permanently shut down. This permit expires if all equipment is removed from the permitted location(s), notwithstanding the expiration date specified on this permit.

13. Startup, Shutdown, and Malfunction

Pursuant to Section 39.5(7)(a) of the Act, in the event of an action to enforce the terms or conditions of this permit, this permit does not prohibit a Permittee from invoking any affirmative defense that is provided by the applicable law or rule.

Section 3 - Source Requirements

1. Applicable Requirements

Pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act, the Permittee shall comply with the following applicable requirements. These requirements are applicable to all emission units (including insignificant activities unless specified otherwise in this Section) at the source.

a. **Fugitive Particulate Matter**

i. Pursuant to 35 IAC 212.301 and 35 IAC 212.314, no person shall cause or allow the emission of fugitive particulate matter from any process, including any material handling or storage activity, that is visible by an observer looking generally toward the zenith at a point beyond the property line of the source unless the wind speed is greater than 25 mph.

ii. Compliance Method (Fugitive Particulate Matter)

Upon request by the IEPA, the Permittee shall conduct observations at the property line of the source for visible emissions of fugitive particular matter from the source to address compliance with 35 IAC 212.301. For this purpose, daily observations shall be conducted for a week for particular area(s) of concern at the source, as specified in the request, observations shall begin either within one day or three days of receipt of a written request from the IEPA, depending, respectively, upon whether observations will be conducted by employees of the Permittee or a third-party observer hired by the Permittee to conduct observations on its behalf. The Permittee shall keep records for these observations, including identity of the observer, the date and time of observations, the location(s) from which observations were made, and duration of any fugitive emissions event(s).

b. **Ozone Depleting Substances**

Pursuant to 40 CFR 82.150(b), the Permittee shall comply with the standards for recycling and emissions reduction of ozone depleting substances pursuant to 40 CFR Part 82, Subpart F, except as provided for motor vehicle air conditioners in Subpart B of 40 CFR Part 82:

i. Pursuant to 40 CFR 82.156, persons opening appliances for maintenance, service, repair, or disposal must comply with the required practices.

ii. Pursuant to 40 CFR 82.158, equipment used during the maintenance, service, repair, or disposal of appliances must comply with the standards for recycling and recovery equipment.

iii. Pursuant to 40 CFR 82.161, persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program.

iv. Pursuant to 40 CFR 82 Subpart B, any person performing service on a motor vehicle for consideration when this service involves the refrigerant in the motor vehicle air conditioner shall comply with 40 CFR 82 Subpart B, Servicing of Motor Vehicle Air Conditioners.

v. Pursuant to 40 CFR 82.166, all persons shall comply with the reporting and recordkeeping requirements of 40 CFR 82.166.

c. **Asbestos Demolition and Renovation**

i. Asbestos Fees. Pursuant to Section 9.13(a) of the Act, for any site for which the Owner or Operator must file an original 10-day notice of intent to renovate or

demolish pursuant to Condition 3.1(b)(ii) below and 40 CFR 61.145(b), the owner or operator shall pay to the IEPA with the filing of each 10-day notice a fee of $150.00.

ii. Pursuant to 40 CFR 61 Subpart M, Standard of Asbestos, prior to any demolition or renovation at this facility, the Permittee shall fulfill notification requirements of 40 CFR 61.145(b).

iii. Pursuant to 40 CFR 61.145(c), during demolition or renovation, the Permittee shall comply with the procedures for asbestos emission control established by 40 CFR 61.145(c).

d. **NESHAP Standards (40 CFR 63 Subpart DDDDD)**

Pursuant to 40 CFR 63.7495(b), the Permittee must:

i. Meet the applicable general provisions of 40 CFR 63 Subpart A. See Condition 7.2(b).

ii. Have a one-time energy assessment performed on the source as specified in 40 CFR 63 Subpart DDDDD Table 3 Condition 3, pursuant to 40 CFR 63.7500(a)(1).

e. **Future Emission Standards**

Pursuant to Section 39.5(15)(a) of the Act, this source shall comply with any new or revised applicable future standards of 40 CFR 60, 61, 62, or 63; or 35 IAC Subtitle B after the date issued of this permit. The Permittee shall, in accordance with the applicable regulation(s), comply with the applicable requirements by the date(s) specified and shall certify compliance with the applicable requirements of such regulation(s) as part of the annual compliance certification, as required by Condition 2.6(a). This permit may also have to be revised or reopened to address such new regulations in accordance to Condition 2.9.

2. Applicable Plans and Programs

Pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act, the Permittee shall comply with the following applicable requirements. These requirements are applicable to all emission units (including insignificant activities unless specified otherwise in this Section) at the source.

a. **Fugitive PM Operating Program**

Should this source become subject to 35 IAC 212.302, the Permittee shall prepare and operate under a Fugitive PM Operating Program consistent with 35 IAC 212.310 and submitted to the IEPA for its review. The Fugitive PM Operating Program shall be designed to significantly reduce fugitive particulate matter emissions, pursuant to 35 IAC 212.309(a). Any future Fugitive PM Operating Program made by the Permittee during the permit term is automatically incorporated by reference provided the Fugitive PM Operating Program is not expressly disapproved, in writing, by the IEPA within 30 days of receipt of the Fugitive PM Operating Program. In the event that the IEPA notifies the Permittee of a deficiency with any Fugitive PM Operating Program, the Permittee shall be required to revise and resubmit the Fugitive PM Operating Program within 30 days of receipt of notification to address the deficiency pursuant to Section 39.5(7)(a) of the Act.

b. **PM_{10} Contingency Measure Plan**

Should this source become subject to 35 IAC 212.700, then the Permittee shall prepare and operate under a PM_{10} Contingency Measure Plan reflecting the PM_{10} emission reductions as set forth in 35 IAC 212.701 and 212.703. The Permittee shall, within 90 days after the

date this source becomes subject to 35 IAC 212.700, submit a request to modify this CAAPP permit in order to include a new, appropriate PM_{10} Contingency Measure Plan.

c. **Episode Action Plan**

Should this source become subject to 35 IAC 244.142, the Permittee shall prepare, submit, and operate under an Episode Action Plan for reducing the levels of emissions during yellow alerts, red alerts, and emergencies, consistent with safe operating procedures and submitted to the IEPA for its review. The Episode Action Plan shall contain the information specified in 35 IAC 244.144. The Permittee shall immediately implement the appropriate steps described in this Episode Action Plan should an air pollution alert or emergency be declared. Any future Episode Action Plan made by the Permittee during the permit term is automatically incorporated by reference provided the Episode Action Plan is not expressly disapproved, in writing, by the IEPA within 30 days of receipt of the Episode Action Plan. In the event that the IEPA notifies the Permittee of a deficiency with any Episode Action Plan, the Permittee shall be required to revise and resubmit the Episode Action Plan within 30 days of receipt of notification to address the deficiency pursuant to Section 39.5(7)(a) of the Act.

d. **Risk Management Plan (RMP)**

i. Pursuant to 40 CFR 68.215(a), the Permittee shall have a Risk Management Plan registered with the USEPA that includes information required by 40 CFR 68.150.

ii. The Permittee shall keep a copy of the Risk Management Plan and shall update the Risk Management Plan with the USEPA pursuant to 40 CFR 68.190.

3. Title I Requirements

a. i. **Construction Permit 11050010 Requirements [T1]**

A. Pursuant to Construction Permit #11050010, VOM emissions from all sterilization chambers at the Willowbrook II facility shall not exceed the following limits:. [T1]

Process	Emissions	
	Tons/Month	Tons/Year
Vacuum Pump	0.20	1.16
Back Vent	0.21	1.22
Total	0.41	2.38

ii. Compliance Method (Construction Permit #11050010)

Monitoring

A. Compliance with monthly and annual VOM emission limits in shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

Recordkeeping

B. The Permittee shall maintain the following operational and emission records for the Willowbrook II facility:

I. VOM emissions (tons/month and tons/year) with supporting calculations and documentation.

4. Synthetic Minor Limits

As of the date of issuance of this permit, there are no source-wide synthetic minor limits that need to be included in this Condition.

5. Reporting Requirements

The Permittee shall submit the following information pursuant to Section 39.5(7)(f) of the Act. Addresses are included in Attachment 3.

a. **Prompt Reporting**

i. A. Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the IEPA, Air Compliance Section, within 30 days of deviations from applicable requirements as follows:

I. Requirements in Conditions 3.1(a)(i), 3.1(b), 3.1(c), 3.1(d), and 3.1(e).

II. Requirements in Conditions 3.2(a), 3.2(b), 3.2(c), and 3.2(d).

B. All such deviations shall be summarized and reported as part of the Semiannual Monitoring Report required by Condition 3.5(b).

ii. The Permittee shall notify the IEPA, Air Compliance Section, of all other deviations as part of the Semiannual Monitoring Report required by Condition 3.5(b).

iii. The deviation reports shall contain at a minimum the following information:

A. Date and time of the deviation.

B. Emission unit(s) and/or operation involved.

C. The duration of the event.

D. Probable cause of the deviation.

E. Corrective actions or preventative measures taken.

iv. All deviation reports required in this Permit shall be identified, summarized, and reported as part of the Semiannual Monitoring Report required by Condition 3.5(b).

b. **Semiannual Reporting**

i. Pursuant to Section 39.5(7)(f)(i) of the Act, the Permittee shall submit a Semi-Annual Monitoring Report to the Illinois EPA, Air Compliance Section, summarizing required monitoring and identifying all instances of deviation from the permit, every six months as follows, unless more frequent reporting is required elsewhere in this Permit.

Monitoring Period	Report Due Date
January through June	July 31
July through December	January 31

ii. The Semiannual Monitoring Report must be certified by a Responsible Official consistent with Condition 2.6(b).

Note: Required monitoring includes all applicable monitoring, testing, recordkeeping, and reporting requirements. This may include monitoring requirements not addressed within the Compliance Method Sections of this Permit.

c. **Annual Emissions Reporting**

Pursuant to 35 IAC Part 254, the Source shall submit an Annual Emission Report to the Air Quality Planning Section, due by May 1 of the year following the calendar year in which the emissions took place. All records and calculations upon which the verified and reported data are based must be retained by the source.

Section 4 - Emission Unit Requirements

4.1 Willowbrook I Sterilization Chambers

1. Emission Units and Operations

Emission Units	*Pollutants Being Regulated*	*Original Construction Date*	*Modification/ Reconstruction Date*	*Air Pollution Control Devices or Measures*	*Monitoring Devices*
(6) Ethylene Oxide/Propylene Oxide Sterilization Chambers ((6) Pallet Capacity (SC-1))	VOM	1984	1990	Acid Water Scrubber (Scrubber #1) or Acid Water Scrubber (Scrubber #2) with Dry Bed Reactor	Level Transmitter
(6) Ethylene Oxide/Propylene Oxide Sterilization Chambers ((13) Pallet Capacity (SC-2))	VOM	1984	1998	Acid Water Scrubber (Scrubber #1) or Acid Water Scrubber (Scrubber #2) with Dry Bed Reactor	Level Transmitter
(1) Ethylene Oxide/Propylene Oxide Sterilization Chambers ((3) Pallet Capacity (SC-3))	VOM	1984	1990	Acid Water Scrubber (Scrubber #1) or Acid Water Scrubber (Scrubber #2) with Dry Bed Reactor	Level Transmitter
(1) Ethylene Oxide/Propylene Oxide Sterilization Chambers ((1) Pallet Capacity (SC-5))	VOM	1984	1990	Acid Water Scrubber (Scrubber #1) or Acid Water Scrubber (Scrubber #2) with Dry Bed Reactor	Level Transmitter

2. Applicable Requirements

For the emission units in Condition 4.1.1 above, the Permittee shall comply with the following applicable requirements pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act.

a. i. <u>Volatile Organic Material Requirements (VOM)</u>

A. Pursuant to 35 IAC 218.986, Subpart TT, every owner or operator of the above emission units shall have an emission capture and control equipment which achieves an overall reduction in uncontrolled VOM emissions of at least 81 percent from each emission unit.

ii. <u>Compliance Method (VOM Requirements)</u>

<u>Recordkeeping</u>

A. Pursuant to 35 IAC 218.991, Subpart UU, the Permittee shall collect and record all of the following information each day and maintain the information at the source for a period of three years.

I. Control device monitoring data.

II. A log of operating time for the capture system, control device, monitoring equipment and the associated emission source.

III. A maintenance log for the capture system, control device and monitoring equipment detailing all routine and non-routine maintenance performed including dates and duration of any outages.

C. Pursuant to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, the Willowbrook I Sterilization Chambers are subject to 40 CFR Part 64. The Permittee shall comply with the monitoring requirements of the CAM Plan described in Condition 7.3 and Table 7.3.1, pursuant to 40 CFR Part 64 as submitted in the Permittee's CAM plan application. At all times, the Owner or Operator shall maintain the monitoring, including but not limited to, maintaining necessary parts for routine repairs of the monitoring equipment, pursuant to 40 CFR 64.7(a) and (b).

b. i. **Hazardous Air Pollutant Requirements (HAP)**

A. Pursuant to 40 CFR 63.362(a), any source using greater than 10 tons of ethylene oxide shall reduce the emissions from the sterilization chamber vent by 99%.

ii. Compliance Method (HAP Requirements)

Monitoring

A. Pursuant to 40 CFR 63.363(b), the Permittee shall determine the efficiency of control devices used to comply with 40 IAC 63.362(c) using the test methods and procedures in 40 IAC 63.365(b) and shall operate them accordingly.

B. Pursuant to Section 39.5(7)(a) and (d), the Permittee shall inspect each scrubber once each year to ensure the proper functioning of each scrubber.

C. The operational and production requirements (4.1.2(c)(B),(C) and (D)) will insure compliance with the HAP requirement in 4.1.2(b)(i)(A).

Testing

D. Pursuant to Section 39.5(7)(b) and (d), the Permittee shall conduct a performance test to demonstrate the efficiency of one of the scrubbers within the first 18 months of the issuance of the permit and within 9 months of the receipt of the renewal CAAPP permit application. The performance test shall be conducted in accordance with 40 CFR 63.365 and all others referenced in that method. The Permittee shall comply with the applicable requirements in Condition 7.2.

E. Pursuant to Section 39.5(7)(b) and (d), the Permittee shall establish the maximum liquor tank level referenced in 40 CFR 63.365(e)(2) for each performance test.

Recordkeeping

F. Pursuant to Section 39.5(7)(a) and (e), records of the following shall be kept:

I. Records for periodic inspection of the acid water scrubber and dry bed reactor with date, individual performing the inspection, and nature of the inspection.

II. Records for prompt repair of defects, with identification and description of defect, effect on emissions, date identified, date repaired, and nature of repair.

c. i. **Operational and Production Requirements**

A. Pursuant to Construction Permit #90080038, monthly usage of propylene oxide and ethylene oxide shall not exceed 2,800 lbs and 70,000 lbs respectively. [T1]

B. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall not operate the Willowbrook I Sterilization Chambers with a level of scrubber liquor in the recirculation tank of Scrubber #2 which exceeds 159 inches or the liquor level from the most recent performance test. If Scrubber #1 is in operation, the scrubber recirculation tank shall not exceed 5,200 gallons.

C. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall exhaust no more than five of the Willowbrook I Sterilization Chambers to the acid scrubbers and dry bed reactors during the first evacuation.

D. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall keep the scrubber and recirculation tank pH below 2.

ii. Compliance Method (Operational and Production Requirements)

Monitoring

A. Compliance with annual limits shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

B. Pursuant to Section 39.5(7)(a) and (e), the Permittee shall monitor the scrubber recirculation tank of Scrubber #2. If Scrubber #1 is in operation, the level of the recirculation tank of Scrubber #1 shall be monitored.

C. Pursuant to Section 39.5(7)(a) and (e), the Permittee shall take a pH reading of the scrubber and scrubber recirculation tank when the recirculation tank is first charged with water and sulfuric acid. Following this, the pH shall be taken every week thereafter until the recirculation tank is emptied.

Recordkeeping

D. Pursuant to Section 39.5(7)(a) and (e), the following records shall be kept:

I. Ethylene oxide usage (tons/month and tons/year).

II. Propylene oxide usage (tons/month and tons/year).

III. The level of the scrubber liquor in the recirculation tank shall be recorded on a weekly basis.

IV. Records of a procedure in the control system that does not allow for more than five chambers to be evacuated during the first evacuation.

V. pH reading of the scrubber recirculation tank and scrubber for each sample taken.

3. Non-Applicability Determinations

a. The Willowbrook I Sterilization Chambers are not subject to the National Emission Standards for Hazardous Air Pollution (NESHAP) for Hospital Ethylene Oxide Sterilizers, 40 CFR Part 63 Subpart WWWWW, because the Willowbrook I Sterilization Chambers are not part of a hospital.

b. The Willowbrook I Sterilization Chambers are not subject to 35 IAC 218.301, Subpart G, because the Willowbrook I Sterilization Chambers do not use a photochemically reactive material as defined by 35 IAC 211.4690.

c. The Willowbrook I Sterilization Chambers are not subject to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, for HAP because the Willowbrook I sterilization chambers are subject to a NESHAP proposed after November 15, 1990, pursuant to 40 CFR 64.2(b)(1)(i).

4. Other Requirements

For the emission units in Condition 4.1.1 above, the Permittee shall comply with the following applicable requirements pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act.

a. **Start-up, Shutdown, and Malfunction Breakdown Requirements**

i. Authorization for Federal Requirements

a. Malfunction Breakdown Requirements

Pursuant to 40 CFR 63.362 (b), the source is authorized to continue operation in violation of the applicable requirements of Conditions 4.1.2(b)(i)(A) for HAPs during malfunction breakdown. The Permittee shall comply with all applicable requirements in Section 7.3 of this permit.

5. Reporting Requirements

The Permittee shall submit the following information pursuant to Section 39.5(7)(f) of the Act. Addresses are included in Attachment 3.

a. **Prompt Reporting**

i. A. Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the IEPA, Air Compliance Section, within 30 days of deviations from applicable requirements as follows unless a different period is specified by a particular permit provision, i.e., NSPS or NESHAP requirement:

I. Requirements in Conditions 4.1.2(a)(i), 4.1.2(b)(i), and 4.1.2(c)(i).

II. Requirements in Condition 4.1.4(a)(i).

B. All such deviations shall be summarized and reported as part of the Semiannual Monitoring Report required by Condition 3.5(b).

ii. The Permittee shall notify the IEPA, Air Compliance Section, of all other deviations as part of the Semiannual Monitoring Report required by Condition 3.5(b).

iii. The deviation reports shall contain at a minimum the following information:

A. Date and time of the deviation.

B. Emission unit(s) and/or operation involved.

C. The duration of the event.

D. Probable cause of the deviation.

E. Corrective actions or preventative measures taken.

4.2 Willowbrook II Sterilization Chambers

1. Emission Units and Operations

Emission Units	*Pollutants Being Regulated*	*Original Construction Date*	*Modification/ Reconstruction Date*	*Air Pollution Control Devices or Measures*	*Monitoring Devices*
(3) Ethylene Oxide/Propylene Oxide Sterilization Chambers ((13) Pallet Capacity (SC-4))	VOM	1999	N/A	Willowbrook II Scrubber (WBII-Scrubber) and Dry Bed Reactor	Level Transmitter
(1) Ethylene Oxide/Propylene Oxide Sterilization Chambers ((26) Pallet Capacity (SC-4))	VOM	2012	N/A	Willowbrook II Scrubber (WBII-Scrubber) and Dry Bed Reactor	Level Transmitter

2. Applicable Requirements

For the emission units in Condition 4.2.1 above, the Permittee shall comply with the following applicable requirements pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act.

a. i. **Volatile Organic Material Requirements (VOM)**

A. Pursuant to 35 IAC 218.986, Subpart TT, every owner or operator of the above emission units shall have an emission capture and control equipment which achieves an overall reduction in uncontrolled VOM emissions of at least 81 percent from each emission unit

ii. Compliance Method (VOM Requirements)

Monitoring

A. Sufficient monitoring to meet compliance with 4.2.2(a)(i)(A) is found in condition 4.2.2(b)(ii)(A).

Recordkeeping

B. Pursuant to 35 IAC 218.991, Subpart UU, the Permittee shall collect and record all of the following information each day and maintain the information at the source for a period of three years.

I. Control device monitoring data.

II. A log of operating time for the capture system, control device, monitoring equipment and the associated emission source.

III. A maintenance log for the capture system, control device and monitoring equipment detailing all routine and non-routine maintenance performed including dates and duration of any outages.

C. Pursuant to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, the Willowbrook II Sterilization Chambers are subject to 40 CFR Part 64. The Permittee shall comply with the monitoring requirements of the CAM Plan described in Condition 7.3 and Table 7.3.2, pursuant to 40 CFR Part 64 as submitted in the Permittee's CAM plan application. At all times, the Owner or Operator shall maintain the monitoring, including but not limited to, maintaining necessary parts for routine repairs of the monitoring equipment, pursuant to 40 CFR 64.7(a) and (b).

b. i. **Hazardous Air Pollutant Requirements (HAP)**

A. Pursuant to 40 CFR 63.362(a), any source using greater than 10 tons of ethylene oxide shall reduce the emissions from the sterilization chamber vent by 99%.

ii. Compliance Method (HAP Requirements)

Monitoring

A. Pursuant to 40 CFR 63.363(b), the Permittee shall determine the efficiency of control devices used to comply with 40 IAC 63.362(c) using the test methods and procedures in 40 IAC 63.365(b) and shall operate them accordingly.

B. The operational and production requirements (4.2.2(c)(B),(C) and (D)) will insure compliance with the HAP requirement in 4.2.2(b)(i)(A).

Testing

C. Pursuant to Section 39.5(7)(b) and (d), the Permittee shall conduct a performance test to demonstrate the efficiency of one of the scrubbers within the first 18 months of the issuance of the permit and within 9 months of the receipt of the renewal CAAPP permit application being sent out. The performance test shall be conducted in accordance with 40 CFR 63.365 and all others referenced in that method. The Permittee shall comply with the applicable requirements in Condition 7.2.D. Pursuant to Section 39.5(7)(b) and (d), the Permittee shall establish the maximum liquor tank level referenced in 40 CFR 63.365(e)(2) for each performance test.

Recordkeeping

E. Pursuant to Section 39.5(7)(a) and (e), records of the following shall be kept:

I. Records for periodic inspection of the acid water scrubber and dry bed reactor with date, individual performing the inspection, and nature of the inspection.

II. Records for prompt repair of defects, with identification and description of defect, effect on emissions, date identified, date repaired, and nature of repair.

III. The level of the scrubber liquor in the recirculation tank shall be recorded on a weekly basis.

c. i. **Operational and Production Requirements**

A. Pursuant to Construction Permit #11050010, the Permittee shall not use more than 20.4 tons/month and 122.1 tons/year of ethylene oxide and propylene oxide, total, for all sterilization chambers at the Willowbrook II facility. [T1]

B. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall not operate the Willowbrook II sterilization chambers with a level of scrubber liquor in the recirculation tank which exceeds 202 inches or the liquor level from the most recent performance test.

C. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall exhaust no more than three (3) Willowbrook II sterilization chambers to the acid water scrubbers and dry bed reactors during the first evacuation.

D. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall keep the scrubber and scrubber recirculation pH below 2.

ii. Compliance Method (Operational and Production Requirements)

Monitoring

A. Compliance with monthly and annual usage limits for propylene oxide and ethylene oxide shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

B. Pursuant to Section 39.5(7)(a) and (e), the Permittee shall monitor the scrubber recirculation tank level of the WBII Scrubber.

C. Pursuant to Section 39.5(7)(a) and (e), the Permittee shall take a pH reading of the scrubber and scrubber recirculation tank when the recirculation tank is first charged with water and sulfuric acid. Following this, the pH shall be taken every week thereafter until the recirculation tank is emptied.

Recordkeeping

D. Pursuant to Section 39.5(7)(a) and (e), the Permittee shall maintain the following operational and emission records for the Willowbrook II facility:

I. Ethylene oxide usage (tons/month and tons/year).

II. Propylene oxide usage (tons/month and tons/year).

III. The level of the scrubber liquor in the recirculation tank shall be recorded on a weekly basis.

IV. Records of a procedure in the control system that does not allow for more than three chambers to be evacuated.

V. pH reading of the scrubber recirculation tank and scrubber for each sample taken.

3. Non-Applicability Determinations

a. The Willowbrook II Sterilization Chambers are not subject to the National Emission Standards for Hazardous Air Pollution (NESHAP) for Hospital Ethylene Oxide Sterilizers, 40 CFR Part 63 Subpart WWWWW, because the Willowbrook II Sterilization Chambers do not reside in a hospital.

b. The Willowbrook II Sterilization Chambers are not subject to 35 IAC 218.301, Subpart G, because the Willowbrook II Sterilization Chambers do not use a photochemically reactive material as defined by 35 IAC 211.4690.

c. The Willowbrook II Sterilization Chambers are not subject to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, for ethylene oxide because the Willowbrook II Sterilization Chambers are subject to a NESHAP proposed after November 15, 1990, pursuant to 40 CFR 64.2(b)(1)(i).

d. The Willowbrook II Sterilization Chambers are not subject to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, for propylene oxide because the Willowbrook II Sterilization Chambers do not have potential pre-control device emissions of the applicable regulated air pollutant that equals or exceeds major source threshold levels.

4. Other Requirements

For the emission units in Condition 4.2.1 above, the Permittee shall comply with the following applicable requirements pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act.

a. **Start-up, Shutdown, and Malfunction Breakdown Requirements**

i. Authorization for State Requirements

a. Malfunction Breakdown Requirements

Pursuant to 35 IAC 201.149, 201.261, and 201.262, the source is authorized to continue operation in violation of the applicable requirements of Conditions 4.1.2(b)(i)(A) for HAPs during malfunction breakdown. The Permittee shall comply with all applicable requirements in Section 7.3 of this permit.

5. Reporting Requirements

The Permittee shall submit the following information pursuant to Section 39.5(7)(f) of the Act. Addresses are included in Attachment 3.

a. **Prompt Reporting**

i. A. Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the IEPA, Air Compliance Section, within 30 days of deviations from applicable requirements as follows unless a different period is specified by a particular permit provision, i.e., NSPS or NESHAP requirement:

I. Requirements in Conditions 4.2.2(a)(i), 4.2.2(b)(i), and 4.2.2(c)(i).

II. Requirements in Condition 4.2.4(a)(i).

B. All such deviations shall be summarized and reported as part of the Semiannual Monitoring Report required by Condition 3.5(b).

ii. The Permittee shall notify the IEPA, Air Compliance Section, of all other deviations as part of the Semiannual Monitoring Report required by Condition 3.5(b).

iii. The deviation reports shall contain at a minimum the following information:

A. Date and time of the deviation.

B. Emission unit(s) and/or operation involved.

C. The duration of the event.

D. Probable cause of the deviation.

E. Corrective actions or preventative measures taken.

4.3 Willowbrook I Aeration Rooms

1. Emission Units and Operations

Emission Units	*Pollutants Being Regulated*	*Original Construction Date*	*Modification/ Reconstruction Date*	*Air Pollution Control Devices or Measures*	*Monitoring Devices*
(3) Aeration Rooms (AR)	VOM	1984	1998	Acid Water Scrubber (Scrubber #2) with Dry Bed Reactor	Level Transmitter

2. Applicable Requirements

For the emission units in Condition 4.3.1 above, the Permittee shall comply with the following applicable requirements pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act.

a. i. **Volatile Organic Material Requirements (VOM)**

A. Pursuant to 35 IAC 218.986, Subpart TT, every owner or operator of the above emission units shall have an emission capture and control equipment which achieves an overall reduction in uncontrolled VOM emissions of at least 81 percent from each emission unit.

B. Pursuant to Construction Permit #96120054, the emissions of the aeration rooms shall not exceed the following VOM limits: [T1]

	Operating Hours	Volatile Organic Material Emissions	
Items of Equipment	(Hours/Year)	(Lbs/Hour)	(Tons/Year)
West Aeration Room	8,760	3.6	15.77

ii. Compliance Method (VOM Requirements)

Monitoring

A. Compliance with monthly and annual VOM emission limits for the west aeration room shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

Recordkeeping

B. Sufficient recordkeeping to meet compliance with 4.3.2(a)(i)(A) is found in condition 4.3.2(b)(ii)(B).

C. Pursuant to Section 39.5(7)(a) and (e), the Permittee shall maintain the following operational and emission records for the Willowbrook I facility:

I. Ethylene oxide usage (tons/month and tons/year).

II. Propylene oxide usage (tons/month and tons/year).

III. Calculated VOM emissions based on the efficiency of the scrubber from the most recent performance test.

D. Pursuant to 35 IAC 218.991, the Permittee shall collect and record the following information each day:

I. Control device monitoring data.

II. A log of operating time for the capture system, control device, monitoring equipment and the associated emission source.

III. A maintenance log for the capture system, control device and monitoring equipment detailing all routine and non-routine maintenance equipment detailing all routine and non-routine maintenance performed including dates and duration of any outages.

b. i. **Hazardous Air Pollutant Requirements (HAP)**

A. Pursuant to 40 CFR 63.362(d), each owner or operator of a sterilization source using 1 ton shall reduce ethylene oxide emissions to the atmosphere from each aeration room vent to a maximum concentration of 1 ppmv or by at least 99 percent, whichever is less stringent, from each aeration room vent.

ii. Compliance Method (HAP Requirements)

Monitoring

A. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall not operate the Willowbrook I aeration rooms with a level of scrubber liquor in the recirculation tank of Scrubber #2 which exceeds 159 inches or the liquor level from the most recent performance test.

B Pursuant to 40 CFR 63.363(e), the facility has complied with the emissions limits under § 63.262 with a control technology other than acid-water scrubbers or catalytic or thermal oxidizers, and has provided to the Administrator information describing the design and operation of the air pollution control system, including recommendations for the operating parameters to be monitored to demonstrate continuous compliance. The Permittee has provided an approved monitoring plan as of December 6, 2002.

Testing

C. Pursuant to the alternative monitoring plan approved on December 12, 2002, the Permittee shall collect weekly samples of the exhaust from the stack to test the concentration of ethylene oxide using a Flame Ionization Detector or the Gas Chromatograph. Modified Method 18 testing shall be used to detect the presence of ethylene oxide per the alternative monitoring plan.

Recordkeeping

D. Pursuant to Section 39.5(7)(a) and (e), records of the following shall be kept:

I. Records for periodic inspection of the acid water scrubber and dry bed reactor with date, individual performing the inspection, and nature of the inspection.

II. Records for prompt repair of defects, with identification and description of defect, effect on emissions, date identified, date repaired, and nature of repair.

III. The level of the scrubber liquor in the recirculation tank shall be recorded once per week.

E. Pursuant to Section 39.5(7)(a) and (e), records of the following shall be kept:

I. Record of the ethylene oxide concentration each week (in ppm) from the sampling period.

3. Non-Applicability Determinations

a. The Willowbrook I aeration rooms are not subject to the National Emission Standards for Hazardous Air Pollution (NESHAP) for Hospital Ethylene Oxide Sterilizers, 40 CFR Part 63 Subpart WWWWW, because the Willowbrook I aeration chambers do not reside in a hospital.

b. The Willowbrook I aeration rooms are not subject to 35 IAC 218.301, Subpart G, because the Willowbrook I aeration chambers do not use a photochemically reactive material as defined by 35 IAC 211.4690.

c. The Willowbrook I aeration rooms are not subject to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, for ethylene oxide because the Willowbrook I aeration chambers are subject to a NESHAP proposed after November 15, 1990, pursuant to 40 CFR 64.2(b)(1)(i).

d. The Willowbrook I aeration rooms are not subject to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, for propylene oxide because the Willowbrook I aeration chambers do not have potential pre-control device emissions of the applicable regulated air pollutant that equals or exceeds major source threshold levels.

4. Other Requirements

As of the date of issuance of this permit, there are no other requirements that need to be included in this Condition.

5. Reporting Requirements

The Permittee shall submit the following information pursuant to Section 39.5(7)(f) of the Act. Addresses are included in Attachment 3.

a. **Prompt Reporting**

i. A. Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the IEPA, Air Compliance Section, within 30 days of deviations from applicable requirements as follows unless a different period is specified by a particular permit provision, i.e., NSPS or NESHAP requirement:

I. Requirements in Conditions 4.3.2(a)(i), and 4.3.2(b)(i).

B. All such deviations shall be summarized and reported as part of the Semiannual Monitoring Report required by Condition 3.5(b).

ii. The Permittee shall notify the IEPA, Air Compliance Section, of all other deviations as part of the Semiannual Monitoring Report required by Condition 3.5(b).

iii. The deviation reports shall contain at a minimum the following information:

A. Date and time of the deviation.

B. Emission unit(s) and/or operation involved.

C. The duration of the event.

D. Probable cause of the deviation.

E. Corrective actions or preventative measures taken.

4.4 Willowbrook II Aeration Rooms

1. Emission Units and Operations

Emission Units	*Pollutants Being Regulated*	*Original Construction Date*	*Modification/ Reconstruction Date*	*Air Pollution Control Devices or Measures*	*Monitoring Devices*
(2) Aeration Rooms (WBII-AR)	VOM	1999	N/A	Willowbrook II Scrubber (WBII Scrubber) and Dry Bed Reactor	Level Transmitter

2. Applicable Requirements

For the emission units in Condition 4.4.1 above, the Permittee shall comply with the following applicable requirements pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act.

a. i. **Volatile Organic Material Requirements (VOM)**

A. Pursuant to 35 IAC 218.986, Subpart TT, every owner or operator of the above emission units shall have an emission capture and control equipment which achieves an overall reduction in uncontrolled VOM emissions of at least 81 percent from each emission unit.

B. Pursuant to Construction Permit #11050010, VOM emissions from all aeration rooms at the Willowbrook II facility shall not exceed the following limits: [T1]

Process	VOM Emissions	
	Tons/Month	Tons/Year
Aeration rooms	---	0.05
Total	---	0.05

ii. Compliance Method (VOM Requirements)

Monitoring

A. Compliance with monthly and annual VOM emission limits for the west aeration rooms shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

Recordkeeping

B. Sufficient recordkeeping to meet compliance with 4.3.2(a)(i)(A) is found in condition 4.3.2(b)(ii)(B).

C. Pursuant to Section 39.5(7)(a) and (e), the Permittee shall maintain the following operational and emission records for the Willowbrook II facility:

I. Calculated VOM emissions based on the efficiency of the scrubber from the most recent performance test.

D. Pursuant to 35 IAC 218.991, the Permittee shall collect and record the following information each day:

I. Control device monitoring data.

II. A log of operating time for the capture system, control device, monitoring equipment and the associated emission source.

III. A maintenance log for the capture system, control device and monitoring equipment detailing all routine and non-routine

maintenance equipment detailing all routine and non-routine maintenance performed including dates and duration of any outages.

b. i. **Hazardous Air Pollutant Requirements (HAP)**

A. Pursuant to 40 CFR 63.362(d), each owner or operator of a sterilization source using 1 ton shall reduce ethylene oxide emissions to the atmosphere from each aeration room vent to a maximum concentration of 1 ppmv or by at least 99 percent (60 ppm as per the alternative monitoring plan), whichever is less stringent, from each aeration room vent.

ii. Compliance Method (HAP Requirements)

Monitoring

A. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall not operate the Willowbrook I Sterilization Chambers with a level of scrubber liquor in the recirculation tank which exceeds 202 inches or the liquor level from the most recent performance test.

B. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall not exhaust more than one (1) aeration room to the acid water scrubber and dry bed reactor at a time.

C. Pursuant to 40 CFR 63.363(e), the facility has complied with the emissions limits under § 63.262 with a control technology other than acid-water scrubbers or catalytic or thermal oxidizers, and has provided to the Administrator information describing the design and operation of the air pollution control system, including recommendations for the operating parameters to be monitored to demonstrate continuous compliance. The Permittee has provided an approved monitoring plan as of December 6, 2002.

Testing

D. Pursuant to the alternative monitoring plan approved on December 12, 2002, the Permittee shall collect weekly samples of the exhaust from the stack to test the concentration of ethylene oxide using a Flame Ionization Detector or the Gas Chromatograph. Modified Method 18 testing shall be used to detect the presence of ethylene oxide per the alternative monitoring plan.

Recordkeeping

E. Pursuant to Section 39.5(7)(a) and (e), records of the following shall be kept:

I. Records for periodic inspection of the acid water scrubber and dry bed reactor with date, individual performing the inspection, and nature of the inspection.

II. Records for prompt repair of defects, with identification and description of defect, effect on emissions, date identified, date repaired, and nature of repair.

III. The level of the scrubber liquor in the recirculation tank shall be recorded once per week.

F. Pursuant to Section 39.5(7)(a) and (e), records of the following shall be kept:

I. Record of the ethylene oxide concentration each week (in ppm) from the sampling port.

3. Non-Applicability Determinations

a. The Willowbrook II aeration rooms are not subject to the National Emission Standards for Hazardous Air Pollution (NESHAP) for Hospital Ethylene Oxide Sterilizers, 40 CFR Part 63 Subpart WWWWW, because the Willowbrook II aeration chambers do not reside in a hospital.

b. The Willowbrook II aeration rooms are not subject to 35 IAC 218.301, Subpart G, because the Willowbrook II aeration chambers do not use a photochemically reactive material as defined by 35 IAC 211.4690.

c. The Willowbrook II aeration rooms are not subject to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, for ethylene oxide because the Willowbrook II aeration chambers are subject to a NESHAP proposed after November 15, 1990, pursuant to 40 CFR 64.2(b)(1)(i).

d. The Willowbrook II aeration rooms are not subject to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, for propylene oxide because the Willowbrook II aeration chambers do not have potential pre-control device emissions of the applicable regulated air pollutant that equals or exceeds major source threshold levels.

4. Other Requirements

As of the date of issuance of this permit, there are no other requirements that need to be included in this Condition.

5. Reporting Requirements

The Permittee shall submit the following information pursuant to Section 39.5(7)(f) of the Act. Addresses are included in Attachment 3.

a. **Prompt Reporting**

i. A. Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the IEPA, Air Compliance Section, within 30 days of deviations from applicable requirements as follows unless a different period is specified by a particular permit provision, i.e., NSPS or NESHAP requirement:

I. Requirements in Conditions 4.4.2(a)(i) and 4.4.2(b)(i).

B. All such deviations shall be summarized and reported as part of the Semiannual Monitoring Report required by Condition 3.5(b).

ii. The Permittee shall notify the IEPA, Air Compliance Section, of all other deviations as part of the Semiannual Monitoring Report required by Condition 3.5(b).

iii. The deviation reports shall contain at a minimum the following information:

A. Date and time of the deviation.

B. Emission unit(s) and/or operation involved.

C. The duration of the event.

D. Probable cause of the deviation.

E. Corrective actions or preventative measures taken.

4.5 Willowbrook I Boiler #1

1. Emission Units and Operations

Emission Units	*Pollutants Being Regulated*	*Original Construction Date*	*Modification/ Reconstruction Date*	*Air Pollution Control Devices or Measures*	*Monitoring Devices*
Cleaver Brooks Natural Gas Fired Boiler (Boiler-1, 5 mmBtu/hr)	CO, NO_x	2013	N/A	None	None

2. Applicable Requirements

For the emission units in Condition 4.5.1 above, the Permittee shall comply with the following applicable requirements pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act.

a. i. **Opacity Requirements**

A. Pursuant to 35 IAC 212.123, no person shall cause or allow the emission of smoke or other particulate matter, with an opacity greater than 30 percent, into the atmosphere from any emission unit other than those emission units subject to Section 212.122 of this Subpart.

ii. Compliance Method (Opacity Requirements)

Monitoring

A. Pursuant to Sections 39.5(7)(b) and (d) of the Act, at a minimum, the Permittee shall perform observations for opacity on the Willowbrook I Boiler #1 in accordance with Method 22 for visible emissions at least once every calendar year in which the equipment operates. If visible emissions are observed, the Permittee shall take corrective action within 4 hours of such observation. Corrective action may include, but is not limited to, shut down of the Willowbrook I Boiler #1, maintenance and repair, and/or adjustment of fuel usage. If corrective action was taken, the Permittee shall perform a follow up observation for visible emissions in accordance with Method 22. If visible emissions continue, then measurements of opacity in accordance with Method 9 and Section 7.1 shall be conducted within 7 days in accordance with Condition 2.4.

Recordkeeping

B. Pursuant to Section 39.5(7)(b) of the Act, the Permittee shall keep records for each opacity observation performed. These records shall include, at a minimum: date and time the observation was performed, name(s) of observing personnel, identification of which equipment was observed, whether or not the equipment was running properly, the findings of the observation including the presence of any visible emissions, and a description of any corrective action taken including if the corrective action took place within 4 hours of the observation.

C. Pursuant to Section 39.5(7)(b) of the Act, the Permittee shall keep records for all Method 22 and Method 9 opacity measurements made in accordance with Condition 4.4.2(a)(ii)(A) above.

b. i. **Carbon Monoxide Requirements (CO)**

A. Pursuant to Construction Permit #12090024, the Boiler shall not exceed the following CO emission: [T1]

Pollutant	Limits	
	(Lb/Hour)	(Tons/Year)
CO	0.4	1.8

ii. Compliance Method (CO Requirements)

Monitoring

A. Compliance with monthly and annual CO emission limits for the Willowbrook I Boiler #1 shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

B. Pursuant to 40 CFR 63.7540(10(iv), the Permittee shall optimize CO emissions during the boiler tune-up.

Recordkeeping

C. Pursuant to Section 39.5(7)(b) and (e) of the Act, the Permittee shall keep records for the following:

I. Monthly and annual emissions of CO emissions (tons/month and tons/year) with supporting data or calculations.

II. Records of that the CO emissions were optimized during the tune-up.

c. i. **Nitrogen Oxide Requirements (NO_x)**

A. Pursuant to Construction Permit #12090024, the boiler shall not exceed the following NO_x emission limit: [T1]

Pollutant	Limits	
	(Lb/Hour)	(Tons/Year)
NO_x	0.5	2.2

ii. Compliance Method (NO_x Requirements)

A. Compliance with monthly and annual NO_x emission limits for the Willowbrook I Boiler #1 shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

Recordkeeping

B. Pursuant to Section 39.5(7)(b) and (e) of the Act, the Permittee shall keep records for the following:

Monthly and annual emissions of NO_x emissions (tons/month and tons/year) with supporting data or calculations.

d. i. **Operational and Production Requirements**

A. Pursuant to Section 39.5(7)(a) of the Act, pipeline quality natural gas shall be the only fuel fired in the Willowbrook I Boiler #1.

ii. Compliance Method (Operational and Production Requirements)

Recordkeeping

A. The Permittee shall keep a record of the fuel usage and type of fuel used in the Willowbrook I Boiler #1.

e. i. Work Practice Requirements

A. Pursuant to 40 CFR 63.7500(e), NESHAP Subpart DDDDD, the Permittee must complete a tune-up every 5 years as specified in 40 CFR 63.7540(10)(i)-(iv).

ii. Compliance Method (Work Practice Requirements)

Recordkeeping

A. Pursuant to Section 39.5(7)(a) and (e), the Permittee shall maintain records of the following:

I. Date of the tune-up

II. Names of personnel completing the tune-up

III. All adjustments/corrective actions (i.e. to the flame pattern, air-to-fuel ratio, CO emissions)

3. Non-Applicability Determinations

a. The Willowbrook I Boiler #1 not subject to the New Source Performance Standards (NSPS) for Small Industrial-Commercial-Institutional Steam Generating Units, 40 CFR Part 60 Subpart Dc, because the Willowbrook I Boiler #1 has a firing rate below 2.9 MW(10 mmBtu).

b. The Willowbrook I Boiler #1 are not subject to the National Emission Standards for Hazardous Air Pollution (NESHAP) for Industrial, Commercial and Institutional Boilers and Process Heaters, 40 CFR Part 63 Subpart JJJJJJ, because the Willowbrook I Boiler #1 is a major source that fires natural gas.

c. The Willowbrook I Boiler #1 is not subject to 35 IAC 212.201, because the Willowbrook I Boiler #1 does not fire solid fuel and solely fires natural gas.

d. The Willowbrook I Boiler #1 is not subject to 35 IAC 214.122, because the Willowbrook I Boiler #1 does not fire solid or liquid fuel and solely fires natural gas.

e. The Willowbrook I Boiler #1 is not subject to 35 IAC 215.301, because the Willowbrook I Boiler #1 is fuel combustion sources which are exempt from the rule, pursuant to 35 IAC 215.303.

f. The Willowbrook I Boiler #1 not subject to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, because the Willowbrook I Boiler #1 do not use an add-on control device to achieve compliance with an emission limitation.

4. Other Requirements

As of the date of issuance of this permit, there are no other requirements that need to be included in this Condition.

5. Reporting Requirements

The Permittee shall submit the following information pursuant to Section 39.5(7)(f) of the Act. Addresses are included in Attachment 3.

a. Prompt Reporting

i. A. Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the IEPA, Air Compliance Section, within 30 days of deviations from applicable requirements as follows unless a different period is specified by a particular permit provision, i.e., NSPS or NESHAP requirement:

I. Requirements in Conditions 4.5.2(a)(i), 4.5.2(b)(i), 4.5.2(c)(i),. 4.5.2(d)(i), and 4.5.2(e)(i).

B. All such deviations shall be summarized and reported as part of the Semiannual Monitoring Report required by Condition 3.5(b).

ii. The Permittee shall notify the IEPA, Air Compliance Section, of all other deviations as part of the Semiannual Monitoring Report required by Condition 3.5(b).

iii. The deviation reports shall contain at a minimum the following information:

A. Date and time of the deviation.

B. Emission unit(s) and/or operation involved.

C. The duration of the event.

D. Probable cause of the deviation.

E. Corrective actions or preventative measures taken.

4.6 Willowbrook II Boilers #1 and #2

1. Emission Units and Operations

Emission Units	*Pollutants Being Regulated*	*Original Construction Date*	*Modification/ Reconstruction Date*	*Air Pollution Control Devices or Measures*	*Monitoring Devices*
Kewanee Model L35-80-G Natural Gas Fired Boiler (WBII - Boiler-1, 3.3 mmBtu/hr)	PM, CO, NO_x, SO_2, VOM	1999	N/A	None	None
Kewanee Model L35-80-G Natural Gas Fired Boiler (WBII - Boiler-2, 3.3 mmBtu/hr)	PM, CO, NO_x, SO_2, VOM	1999	N/A	None	None

2. Applicable Requirements

a. i. **Opacity Requirements**

A. Pursuant to 35 IAC 212.123, no person shall cause or allow the emission of smoke or other particulate matter, with an opacity greater than 30 percent, into the atmosphere from any emission unit other than those emission units subject to Section 212.122 of this Subpart.

ii. Compliance Method (Opacity Requirements)

Monitoring

A. Pursuant to Sections 39.5(7)(b) and (d) of the Act, at a minimum, the Permittee shall perform observations for opacity on the Willowbrook II Boilers #1 and #2 in accordance with Method 22 for visible emissions at least once every calendar year in which the equipment operates. If visible emissions are observed, the Permittee shall take corrective action within 4 hours of such observation. Corrective action may include, but is not limited to, shut down of the pipeline heaters and Boilers, maintenance and repair, and/or adjustment of fuel usage. If corrective action was taken, the Permittee shall perform a follow up observation for visible emissions in accordance with Method 22. If visible emissions continue, then measurements of opacity in accordance with Method 9 and Section 7.1 shall be conducted within 7 days in accordance with Condition 2.4.

Recordkeeping

B. Pursuant to Section 39.5(7)(b) of the Act, the Permittee shall keep records for each opacity observation performed. These records shall include, at a minimum: date and time the observation was performed, name(s) of observing personnel, identification of which equipment was observed, whether or not the equipment was running properly, the findings of the observation including the presence of any visible emissions, and a description of any corrective action taken including if the corrective action took place within 4 hours of the observation.

C. Pursuant to Section 39.5(7)(b) of the Act, the Permittee shall keep records for all Method 22 and Method 9 opacity measurements made in accordance with Condition 4.4.2(a)(ii)(A) above.

b. i. **Operational and Production Requirements**

A. Pursuant to Section 39.5(7)(a) of the Act, pipeline quality natural gas shall be the only fuel fired in the Willowbrook II Boilers #1 and #2.

ii. Compliance Method (Operational and Production Requirements)

Recordkeeping

A. The Permittee shall keep a record of the fuel usage and type of fuel used in the Willowbrook II Boilers #1 and #2.

c. i. **Work Practice Requirements**

A. Pursuant to 40 CFR 63.7500(e), the Permittee must complete a tune-up every 5 years as specified in 40 CFR 63.7540(10)(i)-(iv).

ii. Compliance Method (Work Practice Requirements)

Recordkeeping

A. Pursuant to Section 39.5(7)(a) and (e), the Permittee shall maintain records of the following:

I. Date of the tune-up.

II. Names of personnel completing the tune-up.

III. All adjustments/corrective actions (i.e. to the flame pattern, air-to-fuel ratio, CO emissions).

3. Non-Applicability Determinations

a. The Willowbrook II Boilers #1 and #2 are not subject to the New Source Performance Standards (NSPS) for Small Industrial-Commercial-Institutional Steam Generating Units, 40 CFR Part 60 Subpart Dc, because the Willowbrook II Boilers #1 and #2 have a firing rate below 2.9 MW(10 mmBtu).

b. The Willowbrook II boiler #1 and #2 are not subject to the National Emission Standards for Hazardous Air Pollution (NESHAP) for Industrial, Commercial and Institutional Boilers and Process Heaters, 40 CFR Part 63 Subpart JJJJJJ, because the Willowbrook II Boilers #1 and #2 are a major sources that only fires natural gas.

c. The Willowbrook II boiler #1 and #2 are not subject to 35 IAC 212.201, because the Willowbrook II Boilers #1 and #2 do not fire solid fuel and solely fire natural gas.

d. The Willowbrook II boiler #1 and #2 are not subject to 35 IAC 214.122, because the Willowbrook II Boilers #1 and #2 do not fire solid or liquid fuel and solely fire natural gas.

e. The Willowbrook II boiler #1 and #2 are not subject to 35 IAC 215.301, because the Willowbrook II Boilers #1 and #2 are fuel combustion sources which are exempt from the rule, pursuant 35 IAC 215.303.

f. The Willowbrook II boiler #1 and #2 are not subject to 35 IAC 216.121, because Willowbrook II Boilers #1 and #2 have an actual heat input less than 2.9 MW (10 mmBtu/hr).

g. The Willowbrook II boiler #1 and #2 are not subject to 35 IAC 217.141, because the Willowbrook II Boilers #1 and #2 have an actual heat input less than 73.2 MW (250 mmBtu/hr) and are not located in the Chicago.

h. The Willowbrook II Boilers #1 and #2 not subject to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, because the Willowbrook II Boilers #1 and #2 do not use an add-on control device to achieve compliance with an emission limitation or standard and do not have potential pre-control device emissions of the applicable regulated air pollutant that equals or exceeds major source threshold levels.

4. Other Requirements

As of the date of issuance of this permit, there are no other requirements that need to be included in this Condition.

5. Reporting Requirements

The Permittee shall submit the following information pursuant to Section 39.5(7)(f) of the Act. Addresses are included in Attachment 3.

a. <u>Prompt Reporting</u>

i. A. Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the IEPA, Air Compliance Section, within 30 days of deviations from applicable requirements as follows unless a different period is specified by a particular permit provision, i.e., NSPS or NESHAP requirement:

I. Requirements in Conditions 4.6.2(a)(i), 4.6.2(b)(i), and 4.6.2(c)(i).

B. All such deviations shall be summarized and reported as part of the Semiannual Monitoring Report required by Condition 3.5(b).

ii. The Permittee shall notify the IEPA, Air Compliance Section, of all other deviations as part of the Semiannual Monitoring Report required by Condition 3.5(b).

iii. The deviation reports shall contain at a minimum the following information:

A. Date and time of the deviation.

B. Emission unit(s) and/or operation involved.

C. The duration of the event.

D. Probable cause of the deviation.

E. Corrective actions or preventative measures taken.

Section 5 - Additional Title I Requirements

This Section is reserved for Title I requirements not specified in Sections 3 or 4. As of the date of issuance of this permit, there are no Title I requirements that need to be separately addressed in this Section.

Section 6 - Insignificant Activities Requirements

1. Insignificant Activities Subject to Specific Regulations

Pursuant to 35 IAC 201.210 and 201.211, the following activities at the source constitute insignificant activities. Pursuant to Sections 9.1(d) and 39.5(6)(a) of the Act, the insignificant activities are subject to specific standards promulgated pursuant to Sections 111, 112, 165, or 173 of the Clean Air Act. The Permittee shall comply with the following applicable requirements:

Insignificant Activity	*Number of Units*	*Insignificant Activity Category*
Direct combustion units used for comfort heating and fuel combustion emission units as further detailed in 35 IAC 201.210(a)(4).	2	35 IAC 201.210(a)(4)

a. **Applicable Requirements**

Pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act, the Permittee shall comply with the following applicable requirements in addition to the applicable requirements in Condition 6.4:

i. **National Emission Standards for Hazardous Air Pollutants (NESHAP)**

A. Pursuant to 40 CFR 63.7500(e), the Permittee must complete a tune-up every 5 years as specified in 40 CFR 63.7540(10)(i)-(iv).

2. Insignificant Activities in 35 IAC 201.210(a)

In addition to any insignificant activities identified in Condition 6.1, the following additional activities at the source constitute insignificant activities pursuant to 35 IAC 201.210 and 201.211:

Insignificant Activity	*Number of Units*	*Insignificant Activity Category*
Storage tanks < 10,000 gallon with annual throughput < 100,000 gallon (not storing gasoline or any material listed as a HAP).	9	35 IAC 201.210(a)(10)

3. Insignificant Activities in 35 IAC 201.210(b)

Pursuant to 35 IAC 201.210, the source has identified insignificant activities as listed in 35 IAC 201.210(b)(1) through (28) as being present at the source. The source is not required to individually list the activities.

4. Applicable Requirements

Insignificant activities in Conditions 6.1 and 6.2 are subject to the following general regulatory limits notwithstanding status as insignificant activities. The Permittee shall comply with the following requirements, as applicable:

a. Pursuant to 35 IAC 212.123(a), no person shall cause or allow the emission of smoke or other particulate matter, with an opacity greater than 30 percent, into the atmosphere from any emission unit other than those emission units subject to 35 IAC 212.122, except as provided in 35 IAC 212.123(b).

b. Pursuant to 35 IAC 214.301, no person shall cause or allow the emission of sulfur dioxide into the atmosphere from any process emission source to exceed 2,000 ppm, except as provided in 35 IAC Part 214.

c. Pursuant to 35 IAC 218.301, no person shall cause or allow the discharge of more than 8 lbs/hr of organic material into the atmosphere from any emission source, except as provided in 35 IAC 218.302, 218.303, 218.304 and the following exception: If no odor nuisance exists the limitation of 35 IAC 215 Subpart K shall apply only to photochemically reactive material.

d. Pursuant to 35 IAC 218.122(b), no person shall cause or allow the loading of any organic material into any stationary tank having a storage capacity of greater than 250 gal, unless such tank is equipped with a permanent submerged loading pipe, submerged fill, or an equivalent device approved by the IEPA according to 35 IAC Part 201 or unless such tank is a pressure tank as described in 35 IAC 215.121(a) or is fitted with a recovery system as described in 35 IAC 215.121(b)(2). Exception as provided in 35 IAC 218.122(c): If no odor nuisance exists the limitations of 35 IAC 215.122 shall only apply to the loading of volatile organic liquid with a vapor pressure of 2.5 psia or greater at 70°F.

e. Pursuant to 35 IAC 218 Subpart TT, VOM emissions from each insignificant activities that is exempt from 35 IAC 218 Subpart TT shall not equal or exceed 2.5 tons per calendar year; and total VOM emissions from insignificant activities, in conjunction with applicable emission units in Section 4 of this permit not complying with 35 IAC 218.986, shall not exceed 5.0 tons per calendar year.

f. Pursuant to 35 IAC 218 Subpart RR, VOM emissions from each insignificant activities that is exempt from 35 IAC 218 Subpart RR shall not equal or exceed 1.0 tons per calendar year; and total VOM emissions from insignificant activities, in conjunction with applicable emission units in Section 4 of this permit not complying with 35 IAC 218.966, shall not exceed 5.0 tons per calendar year.

5. Compliance Method

Pursuant to Section 39.5(7)(b) of the Act, the source shall maintain records of the following items for the insignificant activities in Conditions 6.1 and 6.2:

a. List of all insignificant activities, including insignificant activities added as specified in Condition 6.6, the categories the insignificant activities fall under, and supporting calculations as needed for any insignificant activities listed in 35 IAC 201.210(a)(1) through (3).

b. Potential to emit emission calculations before any air pollution control device for any insignificant activities listed in 35 IAC 201.210(a)(1) through (3).

6. Notification Requirements for Insignificant Activities

The source shall notify the IEPA accordingly to the addition of insignificant activities:

a. <u>Notification 7 Days in Advance</u>

i. Pursuant to 35 IAC 201.212(b), for the addition of an insignificant activity that would be categorized under 35 IAC 201.210(a)(1) and 201.211 and is not currently identified in Conditions 6.1 or 6.2, a notification to the IEPA Permit Section 7 days in advance of the addition of the insignificant activity is required. Addresses are included in Attachment 3. The notification shall include the following pursuant to 35 IAC 201.211(b):

A. A description of the emission unit including the function and expected operating schedule of the unit.

B. A description of any air pollution control equipment or control measures associated with the emission unit.

C. The emissions of regulated air pollutants in lbs/hr and tons/yr.

D. The means by which emissions were determined or estimated.

E. The estimated number of such emission units at the source.

F. Other information upon which the applicant relies to support treatment of such emission unit as an insignificant activity.

ii. Pursuant to 35 IAC 201.212(b), for the addition of an insignificant activity that would be categorized under 35 IAC 201.210(a)(2) through 201.210(a)(18) and is not currently identified in Conditions 6.1 or 6.2, a notification to the IEPA Permit Section 7 days in advance of the addition of the insignificant activity is required. Addresses are included in Attachment 3.

iii. Pursuant to Sections 39.5(12)(a)(i)(b) and 39.5(12)(b)(iii) of the Act, the permit shield described in Section 39.5(7)(j) of the Act (see Condition 2.7) shall not apply to any addition of an insignificant activity noted above.

b. Notification Required at Renewal

Pursuant to 35 IAC 201.212(a) and 35 IAC 201.146(kkk), for the addition of an insignificant activity that would be categorized under 35 IAC 201.210(a) and is currently identified in Conditions 6.1 or 6.2, a notification is not required until the renewal of this permit.

c. Notification Not Required

Pursuant to 35 IAC 201.212(c) and 35 IAC 201.146(kkk), for the addition of an insignificant activity that would be categorized under 35 IAC 201.210(b) as describe in Condition 6.3, a notification is not required.

Section 7 - Other Requirements

1. Testing

a. Pursuant to Section 39.5(7)(a) of the Act, a written test protocol shall be submitted at least sixty (60) days prior to the actual date of testing, unless it is required otherwise in applicable state or federal statutes. The IEPA may at the discretion of the Compliance Section Manager (or designee) accept protocol less than 60 days prior to testing provided it does not interfere with the IEPA's ability to review and comment on the protocol and does not deviate from the applicable state or federal statutes. The protocol shall be submitted to the IEPA, Compliance Section and IEPA, Stack Test Specialist for its review. Addresses are included in Attachment 3. This protocol shall describe the specific procedures for testing, including as a minimum:

i. The name and identification of the emission unit(s) being tested.

ii. Purpose of the test, i.e., permit condition requirement, IEPA or USEPA requesting test.

iii. The person(s) who will be performing sampling and analysis and their experience with similar tests.

iv. The specific conditions under which testing will be performed, including a discussion of why these conditions will be representative of maximum emissions and the means by which the operating parameters for the emission unit and any control equipment will be determined.

v. The specific determinations of emissions and operation which are intended to be made, including sampling and monitoring locations.

vi. The test method(s) that will be used, with the specific analysis method, if the method can be used with different analysis methods. Include if emission tests averaging of 35 IAC 283 will be used.

vii. Any minor changes in standard methodology proposed to accommodate the specific circumstances of testing, with detailed justification. This shall be included as a waiver of the test procedures. If a waiver has already been obtained by the IEPA or USEPA, then the waiver shall be submitted.

viii. Any proposed use of an alternative test method, with detailed justification. This shall be included as a waiver of the test procedures. If a waiver has already been obtained by the IEPA or USEPA, then the waiver shall be submitted.

ix. Sampling of materials, QA/QC procedures, inspections, etc.

b. The IEPA, Compliance Section shall be notified prior to these tests to enable the IEPA to observe these tests pursuant to Section 39.5(7)(a) of the Act as follows:

i. Notification of the expected date of testing shall be submitted in writing a minimum of thirty (30) days prior to the expected test date, unless it is required otherwise in applicable state or federal statutes.

ii. Notification of the actual date and expected time of testing shall be submitted in writing a minimum of five (5) working days prior to the actual date of the test. The IEPA may at its discretion of the Compliance Section Manager (or designee) accept notifications with shorter advance notice provided such notifications will not interfere with the IEPA's ability to observe testing.

c. Copies of the Final Report(s) for these tests shall be submitted to the IEPA, Compliance Section within fourteen (14) days after the test results are compiled and finalized but

no later than ninety (90) days after completion of the test, unless it is required otherwise in applicable state or federal statutes or the IEPA may at the discretion of the Compliance Section Manager (or designee) an alternative date is agreed upon in advance pursuant to Section 39.5(7)(a) of the Act. The Final Report shall include as a minimum:

i. General information including emission unit(s) tested.

ii. A summary of results.

iii. Discussion of conditions during each test run (malfunction/breakdown, startup/shutdown, abnormal processing, etc.).

iv. Description of test method(s), including description of sampling points, sampling train, analysis equipment, and test schedule.

v. Detailed description of test conditions, including:

A. Process information, i.e., mode(s) of operation, process rate, e.g. fuel or raw material consumption.

B. Control equipment information, i.e., equipment condition and operating parameters during testing.

C. A discussion of any preparatory actions taken, i.e., inspections, maintenance and repair.

vi. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration.

vii. An explanation of any discrepancies among individual tests or anomalous data.

viii. Results of the sampling of materials, QA/QC procedures, inspections, etc.

ix. Discussion of whether protocol was followed and description of any changes to the protocol if any occurred.

x. Demonstration of compliance showing whether test results are in compliance with applicable state or federal statutes.

d. Copies of all test reports and other test related documentation shall be kept on site as required by Condition 2.5(b) pursuant to Section 39.5(7)(e)(ii) of the Act.

2. 40 CFR 63 Subpart A Requirements (NESHAP)

a. 40 CFR 63 Subpart A and Subpart O - Ethylene Oxide Emissions Standards for Sterilization Facilities

Pursuant to 40 CFR 63 Subpart A and Subpart O, the Permittee shall comply with the following applicable General Provisions as indicated:

TABLE 1 OF SECTION 63.360 — GENERAL PROVISIONS APPLICABILITY TO SUBPART O

Reference	Applies to sources using 10 tons in Subpart O[a]	Applies to sources using 1 to 10 tons in Subpart O[a]	Comment
63.1(a)(1)	Yes		Additional terms defined in §63.361; when overlap between Subparts A and O occurs, Subpart O takes precedence.
63.1(a)(2)	Yes		
63.1(a)(3)	Yes		
63.1(a)(4)	Yes		Subpart O clarifies the applicability of each paragraph in Subpart A to sources subject to Subpart O.
63.1(a)(5)	No		Reserved.
63.1(a)(6)	Yes		
63.1(a)(7)	Yes		
63.1.1(a)(8)	Yes		
63.1(a)(9)	No		Reserved.
63.1(a)(10)	Yes		
63.1(a)(11)	Yes		§63.366(a) of Subpart O also allows report submissions via fax and on electronic media.
63.1(a)(12)-(14)	Yes		
63.1(b)(1)-(2)	Yes		
63.1(b)(3)	No		§63.367 clarifies the applicability of recordkeeping requirements for sources that determine they are not subject to the emissions standards.
63.1(c)(1)	Yes		Subpart O clarifies the applicability of each paragraph in Subpart A to sources subject to Subpart O in this Table.
63.1(c)(2)	Yes		§63.360(f) exempts area sources subject to this Subpart from the obligation to obtain Title V operating permits.
63.1(c)(3)	No		Reserved.
63.1(c)(4)	Yes		
63.1(c)(5)	No		§63.360 specifies applicability.
63.1(d)	No		Reserved.
63.1(e)	Yes		
63.2	Yes		Additional terms defined in §63.361; when overlap between Subparts A and O occurs, Subpart O takes precedence.

Reference	Applies to sources using 10 tons in Subpart O[a]	Applies to sources using 1 to 10 tons in Subpart O[a]	Comment
63.3	Yes		Other units used in Subpart O are defined in the text of Subpart O.
63.4(a)(1)-(3)	Yes		
63.4(a)(4)	No		Reserved.
63.4(a)(5)	Yes		
63.4(b)	Yes		
63.4(c)	Yes		
63.5(a)	No		§63.366(b)(1) contains applicability requirements for constructed or reconstructed sources.
63.5(b)(1)	Yes	No	
63.5(b)(2)	No		Reserved.
63.5(b)(3)	No		See §63.366(b)(2).
63.5(b)(4)	Yes	No	
63.5(b)(5)	Yes	No	
63.5(b)(6)	Yes	No	
63.5(c)	No		Reserved.
63.5(d)(1)-(2)	No		See §63.366(b)(3).
63.5(d)(3)-(4)	Yes	No	
63.5(e)	Yes	No	
63.5(f)(1)-(2)	No		See §63.366(b)(4).
63.6(a)(1)	Yes		
63.6(a)(2)	No		§63.360 specifies applicability.
63.6(b)-(c)	No		§63.360(g) specifies compliance dates for sources.
63.6(d)	No		Reserved.
63.6(e)	No		Subpart O does not contain any operation and maintenance plan requirements.
63.6(f)(1)	No		§63.362(b) specifies when the standards apply.
63.6(f)(2)(i)	Yes		
63.6(f)(2)(ii)	No		§63.363 specifies parameters for determining compliance.
63.6(f)(2)(iii)-(iv)	Yes		
63.6(f)(2)(v)	No		
63.6(f)(3)	Yes		
63.6(g)	Yes		
63.6(h)	No		Subpart O does not contain any opacity or visible emission standards.
63.6(i)(1)-(14)	Yes		

Reference	Applies to sources using 10 tons in Subpart O[a]	Applies to sources using 1 to 10 tons in Subpart O[a]	Comment
63.6(i)(15)	No		Reserved
63.6(i)(16)	Yes		
63.6(j)	Yes		
63.7(a)(1)	Yes		
63.7(a)(2)	Yes		
63.7(a)(3)	Yes		
63.7(b)	Yes		
63.7(c)	Yes	No	
63.7(d)	Yes	No	
63.7(e)	Yes		§63.365 also contains test methods specific to sources subject to the emissions standards.
63.7(f)	Yes		
63.7(g)(1)	Yes		
63.7(g)(2)	No		Reserved
63.7(g)(3)	Yes		
63.7(h)	Yes		
63.8(a)(1)	Yes		
63.8(a)(2)	Yes		
63.8(a)(3)	No		Reserved
63.8(a)(4)	Yes		
63.8(b)(1)	Yes		
63.8(b)(2)	Yes		
63.8(b)(3)	No		
63.8(c)(1) (i)-(ii)	No		A startup, shutdown, and malfunction plan is not required for these standards.
63.8(c)(1)(iii)	Yes		
63.8(c)(2)-(3)	Yes		
63.8(c)(4)-(5)	No		Frequency of monitoring measurements is provided in §63.364; opacity monitors are not required for these standards.
63.8(c)(6)	No		Performance specifications for gas chromatographs and temperature monitors are contained in §63.365.
63.8(c)(7)(i)(A)-(B)	No		Performance specifications for gas chromatographs and temperature monitors are contained in §63.365.
63.8(c)(7)(i)(C)	No		Opacity monitors are not required for these standards.
63.8(c)(7)(ii)	No		Performance specifications for gas chromatographs and temperature monitors are contained in §63.365.
63.8(c)(8)	No		

Reference	Applies to sources using 10 tons in Subpart O[a]	Applies to sources using 1 to 10 tons in Subpart O[a]	Comment
63.8(d)	Yes	No	
63.8(e)(1)	Yes		
63.8(e)(2)	Yes		
63.8(e)(3)	Yes	No	
63.8(e)(4)	Yes		
63.8(e)(5)(i)	Yes		
63.8(e)(5)(ii)	No		Opacity monitors are not required for these standards.
63.8(f)(1)-(5)	Yes		
63.8(f)(6)	No		
63.8(g)(1)	Yes		
63.8(g)(2)	No		
63.8(g)(3)-(5)	Yes		
63.9(a)	Yes		
63.9(b)(1)-(i)	Yes		
63.9(b)(1)(ii)-(iii)	No		§63.366(c)(1)(i) contains language for sources that increase usage such that the source becomes subject to the emissions standards.
63.9(b)(2)-(3)	Yes		§63.366(c)(3) contains additional information to be included in the initial report for existing and new sources.
63.9(b)(4)-(5)	No		§63.366(c)(1)(ii) and (iii) contains requirements for new or reconstructed sources subject to the emissions standards.
63.9(c)	Yes		
63.9(d)	No		
63.9(e)	Yes		
63.9(f)	No		Opacity monitors are not required for these standards.
63.9(g)(1)	Yes		
63.9(g)(2)-(3)	No		Opacity monitors and relative accuracy testing are not required for these standards.
63.9(h)(1)-(3)	Yes		
63.9(h)(4)	No		Reserved.
63.9(h)(5)	No		§63.366(c)(2) instructs sources to submit actual data.
63.9(h)(6)	Yes		
63.9(i)	Yes		
63.9(j)	Yes		
63.10(a)	Yes		

Reference	Applies to sources using 10 tons in Subpart O[a]	Applies to sources using 1 to 10 tons in Subpart O[a]	Comment
63.10(b)(1)	Yes		
63.10(b)(2)(i)	No		Not applicable due to batch nature of the industry.
63.10(b)(2)(ii)	Yes		
63.10(b)(2)(iii)	No		
63.10(b)(2)(iv)-(v)	No		A startup, shutdown, and malfunction plan is not required for these standards.
63.10(b)(2)(vi)-(xii)	Yes		
63.10(b)(2)(xiii)	No		
63.10(b)(2)(xiv)	Yes		
63.10(b)(3)	No		§63.367 (b) and (c) contains applicability determination requirements.
63.10(c)(1)	Yes		
63.10(c)(2)-(4)	No		Reserved.
63.10(c)(5)	Yes		
63.10(c)(6)	No		
63.10(c)(7)	No		Not applicable due to batch nature of the industry.
63.10(c)(8)	Yes		
63.10(c)(9)	No		
63.10(c)(10)-(13)	Yes		
63.10(c)(14)	Yes	No	
63.10(c)(15)	No		A startup, shutdown, and malfunction plan is not required for these standards.
63.10(d)(1)	Yes		
63.10(d)(2)	Yes		
63.10(d)(3)	No		Subpart O does not contain opacity or visible emissions standards.
63.10(d)(4)	Yes		
63.10(d)(5)	No		A startup, shutdown, and malfunction plan is not required for these standards.
63.10(e)(1)	Yes		
63.10(e)(2)(i)	Yes		
63.10(e)(2)(ii)	No		Opacity monitors are not required for these standards.
63.10(e)(3)(i)-(iv)	Yes		
63.10(e)(3)(v)	No		§63.366(a)(3) specifies contents and submittal dates for excess emissions and monitoring system performance reports.

Reference	Applies to sources using 10 tons in Subpart O[a]	Applies to sources using 1 to 10 tons in Subpart O[a]	Comment
63.10(e)(3)(vi)-(viii)	Yes		
63.10(e)(4)	No		Opacity monitors are not required for these standards.
63.10(f)	Yes		
63.11	Yes		
63.12-63.15	Yes		

b. 40 CFR 63 Subpart A and Subpart DDDDD - Industrial, Commercial, and Institutional Boilers and Process Heaters

Pursuant to 40 CFR 63 Subpart A and Subpart DDDDD, the Permittee shall comply with the following applicable General Provisions as indicated:

Citation	Subject	Applies to Subpart DDDDD
§63.1	Applicability	Yes
§63.2	Definitions	Yes. Additional terms defined in §63.7575
§63.3	Units and Abbreviations	Yes
§63.4	Prohibited Activities and Circumvention	Yes
§63.5	Preconstruction Review and Notification Requirements	Yes
§63.6(a), (b)(1)-(b)(5), (b)(7), (c)	Compliance with Standards and Maintenance Requirements	Yes
§63.6(e)(1)(i)	General duty to minimize emissions.	No. See §63.7500(a)(3) for the general duty requirement.
§63.6(e)(1)(ii)	Requirement to correct malfunctions as soon as practicable.	No
§63.6(e)(3)	Startup, shutdown, and malfunction plan requirements.	No
§63.6(f)(1)	Startup, shutdown, and malfunction exemptions for compliance with non-opacity emission standards.	No
§63.6(f)(2) and (3)	Compliance with non-opacity emission standards.	Yes
§63.6(g)	Use of alternative standards	Yes
§63.6(h)(1)	Startup, shutdown, and malfunction exemptions to opacity standards.	No. See §63.7500(a).
§63.6(h)(2) to (h)(9)	Determining compliance with opacity emission standards	Yes
§63.6(i)	Extension of compliance	Yes. Note: Facilities may also request extension ns of compliance for the installation of combined heat and power, waste heat recovery, or gas pipeline or fuel feeding infrastructure as a means of complying with this Subpart.
§63.6(j)	Presidential exemption.	Yes
§63.7(a), (b), (c), and (d)	Performance Testing Requirements	Yes

Citation	Subject	Applies to Subpart DDDDD
§63.7(e)(1)	Conditions for conducting performance tests	No. Subpart DDDDD specifies conditions for conducting performance tests at §63.7520(a) to (c).
§63.7(e)(2)-(e)(9), (f), (g), and (h)	Performance Testing Requirements	Yes
§63.8(a) and (b)	Applicability and Conduct of Monitoring	Yes
§63.8(c)(1)	Operation and maintenance of CMS	Yes
§63.8(c)(1)(i)	General duty to minimize emissions and CMS operation	No. See §63.7500(a)(3).
§63.8(c)(1)(ii)	Operation and maintenance of CMS	Yes
§63.8(c)(1)(iii)	Startup, shutdown, and malfunction plans for CMS	No
§63.8(c)(2) to (c)(9)	Operation and maintenance of CMS	Yes
§63.8(d)(1) and (2)	Monitoring Requirements, Quality Control Program	Yes
§63.8(d)(3)	Written procedures for CMS	Yes, except for the last sentence, which refers to a startup, shutdown, and malfunction plan. Startup, shutdown, and malfunction plans are not required.
§63.8(e)	Performance evaluation of a CMS	Yes
§63.8(f)	Use of an alternative monitoring method.	Yes
§63.8(g)	Reduction of monitoring data	Yes
§63.9	Notification Requirements	Yes
§63.10(a), (b)(1)	Recordkeeping and Reporting Requirements	Yes
§63.10(b)(2)(i)	Recordkeeping of occurrence and duration of startups or shutdowns	Yes
§63.10(b)(2)(ii)	Recordkeeping of malfunctions	No. See §63.7555(d)(7) for recordkeeping of occurrence and duration and §63.7555(d)(8) for actions taken during malfunctions.
§63.10(b)(2)(iii)	Maintenance records	Yes
§63.10(b)(2)(iv) and (v)	Actions taken to minimize emissions during startup, shutdown, or malfunction	No
§63.10(b)(2)(vi)	Recordkeeping for CMS malfunctions	Yes
§63.10(b)(2)(vii) to (xiv)	Other CMS requirements	Yes

Citation	Subject	Applies to Subpart DDDDD
§63.10(b)(3)	Recordkeeping requirements for applicability determinations	No
§63.10(c)(1) to (9)	Recordkeeping for sources with CMS	Yes
§63.10(c)(10) and (11)	Recording nature and cause of malfunctions, and corrective actions	No. See §63.7555(d)(7) for recordkeeping of occurrence and duration and §63.7555(d)(8) for actions taken during malfunctions.
§63.10(c)(12) and (13)	Recordkeeping for sources with CMS	Yes
§63.10(c)(15)	Use of startup, shutdown, and malfunction plan	No
§63.10(d)(1) and (2)	General reporting requirements	Yes
§63.10(d)(3)	Reporting opacity or visible emission observation results	No
§63.10(d)(4)	Progress reports under an extension of compliance	Yes
§63.10(d)(5)	Startup, shutdown, and malfunction reports	No. See §63.7550(c)(11) for malfunction reporting requirements.
§63.10(e)	Additional reporting requirements for sources with CMS	Yes
§63.10(f)	Waiver of recordkeeping or reporting requirements	Yes
§63.11	Control Device Requirements	No
§63.12	State Authority and Delegation	Yes
§63.13-63.16	Addresses, Incorporation by Reference, Availability of Information, Performance Track Provisions	Yes
§63.1(a)(5),(a)(7)-(a)(9), (b)(2), (c)(3)-(4), (d), 63.6(b)(6), (c)(3), (c)(4), (d), (e)(2), (e)(3)(ii), (h)(3), (h)(5)(iv), 63.8(a)(3), 63.9(b)(3), (h)(4), 63.10(c)(2)-(4), (c)(9).	Reserved	No

3. Compliance Assurance Monitoring (CAM) Requirements

a. CAM Provisions

i. Proper Maintenance

Pursuant to 40 CFR 64.7(b), at all times, the source shall maintain the monitoring, including but not limited to, maintaining necessary parts for routine repairs of the monitoring equipment.

ii. Continued Operation

Pursuant to 40 CFR 64.7(c), except for, as applicable, monitoring malfunctions, associated repairs, and required quality assurance or control activities (including, as applicable, calibration checks and required zero and span adjustments), the source shall conduct all monitoring in continuous operation (or shall collect data at all required intervals) at all times that the pollutant-specific emissions unit (PSEU) is operating. Data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities shall not be used for purposes of 40 CFR Part 64, including data averages and calculations, or fulfilling a minimum data availability requirement, if applicable. The source shall use all the data collected during all other periods in assessing the operation of the control device and associated control system. A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not malfunctions.

iii. Response to Excursions or Exceedances

A. Pursuant to 40 CFR 64.7(d)(1), upon detecting an excursion or exceedance, the source shall restore operation of the PSEU (including the control device and associated capture system) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include minimizing the period of any startup, shutdown or malfunction and taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of an excursion or exceedance (other than those caused by excused startup or shutdown conditions). Such actions may include initial inspection and evaluation, recording that operations returned to normal without operator action (such as through response by a computerized distribution control system), or any necessary follow-up actions to return operation to within the indicator range, designated condition, or below the applicable emission limitation or standard, as applicable.

B. Pursuant to 40 CFR 64.7(d)(2), determination of whether the source has used acceptable procedures in response to an excursion or exceedance will be based on information available, which may include but is not limited to, monitoring results, review of operation and maintenance procedures and records, and inspection of the control device, associated capture system, and the process.

b. Monitoring - Monitoring

Pursuant to 40 CFR 64.7(a), the source shall comply with the monitoring requirements of the CAM Plans as described in 7.3(e) below, pursuant to 40 CFR Part 64 as submitted in the source's CAM plan application.

c. **Monitoring - Recordkeeping**

Pursuant to 40 CFR 64.9(b)(1), the source shall maintain records of the monitoring data, monitor performance data, corrective actions taken, monitoring equipment maintenance, and other supporting information related to the monitoring requirements established for CAM.

d. **Monitoring - Reporting**

Pursuant to Sections 39.5(7)(b) and (f) of the Act, the source shall submit the following reporting requirements:

i. Semiannual Reporting

As part of the required Semiannual Monitoring Reports, the source shall submit a CAM report including the following at a minimum:

A. Summary information on the number, duration, and cause of excursions or exceedances, and the corrective actions taken pursuant to 40 CFR 64.6(c)(3) and 64.9(a)(2)(i).

B. Summary information on the number, duration, and cause for monitoring equipment downtime incidents, other than downtime associated with zero and span or calibration checks pursuant to 40 CFR 64.6(c)(3) and 64.9(a)(2)(ii).

e. **CAM Plans**

The following tables contain the CAM Plans in this CAAPP permit:

Table	Emission Unit Section	PSEU Designation	Pollutant
7.3.1	4.1	WBI Sterilization Chamber	VOM
7.3.2	4.2	WBII Sterilization Chamber	VOM

Table 7.3.1 - CAM Plan

Emission Unit Section:	4.1
PSEU Designation:	WBI Sterilization Chamber
Pollutant:	VOM

Indicators:	#1) Recirculation Tank Level #1	#2) Recirculation Tank Level #2
General Criteria		
The Monitoring Approach Used to Measure the Indicators:	Measure height of tank level in Scrubber #1	Measure height of tank level in Scrubber #2
The Indicator Range Which Provides a Reasonable Assurance of Compliance:	<5200 gallons	< 159 inches
Quality Improvement Plan (QIP) Threshold Levels:	System will alarm and shutdown if tank level approaches 5200 gallons	System will alarm and shutdown if tank level approaches 159 inches
Performance Criteria		
The Specifications for Obtaining Representative Data:	Tank levels are taken visually by level gauge on tank.	Tank levels are taken visually by level gauge on tank.
Verification Procedures to Confirm the Operational Status of the Monitoring:	Trained technicians perform inspection.	Trained technicians perform inspection.
Quality Assurance and Quality Control (QA/QC) Practices that Ensure the Validity of the Data:	Routine preventative maintenance on control system.	Routine preventative maintenance on control system.
The Monitoring Frequency:	Tank level settings are controlled and monitored continuously.	Tank level settings are controlled and monitored continuously.
The Data Collection Procedures That Will Be Used:	Maintenance records	Maintenance records
The Data Averaging Period For Determining Whether an Excursion or Exceedance Has Occurred:	Weekly supervision of records	Weekly supervision of records

Table 7.3.2 - CAM Plan

Emission Unit Section:	4.2
PSEU Designation:	WBII Sterilization Chamber
Pollutant:	VOM

Indicators:	#1) Recirculation Tank Level	
General Criteria		
The Monitoring Approach Used to Measure the Indicators:	Measure height of tank level in Scrubber #1	
The Indicator Range Which Provides a Reasonable Assurance of Compliance:	<202 inches	
Quality Improvement Plan (QIP) Threshold Levels:	System will alarm and shutdown if tank level approaches 5200 gallons	
Performance Criteria		
The Specifications for Obtaining Representative Data:	Tank levels are taken visually by level gauge on tank.	
Verification Procedures to Confirm the Operational Status of the Monitoring:	Trained technicians perform inspection.	
Quality Assurance and Quality Control (QA/QC) Practices that Ensure the Validity of the Data:	Routine preventative maintenance on control system.	
The Monitoring Frequency:	Tank level settings are controlled and monitored continuously.	
The Data Collection Procedures That Will Be Used:	Maintenance records	
The Data Averaging Period For Determining Whether an Excursion or Exceedance Has Occurred:	Weekly supervision of records	

Section 8 - State Only Requirements

1. Permitted Emissions for Fees

The annual emissions from the source for purposes of "Duties to Pay Fees" of Condition 2.3(e), not considering insignificant activities as addressed by Section 6, shall not exceed the following limitations. The overall source emissions shall be determined by adding emissions from all emission units. Compliance with these limits shall be determined on a calendar year basis. The Permittee shall maintain records with supporting calculations of how the annual emissions for fee purposes were calculated. This Condition is set for the purpose of establishing fees and is not federally enforceable. See Section 39.5(18) of the Act.

Pollutant		*Tons/Year*
Volatile Organic Material	(VOM)	11.14
Sulfur Dioxide	(SO_2)	0.01
Particulate Matter	(PM)	0.22
Nitrogen Oxides	(NO_x)	3.00
HAP, not included in VOM or PM	(HAP)	0.00
	Total	14.37

Attachment 1 - List of Emission Units at This Source

Section	*Emission Units*	*Description*
4.1	Willowbrook I Sterilization Chambers	These are the units at Willowbrook I that house medical equipment that is sterilized with ethylene oxide.
4.2	Willowbrook II Sterilization Chambers	These are the units at Willowbrook II that house medical equipment that is sterilized with ethylene oxide.
4.3	Willowbrook I Aeration Rooms	These units allow the recently sterilized equipment to off-gas and are flushed with fresh air.
4.4	Willowbrook II Aeration Rooms	These units allow the recently sterilized equipment to off-gas and are flushed with fresh air.
4.5	Willowbrook I Boiler #1	The boiler provides process steam to the Willowbrook I facility.
4.6	Willowbrook II Boiler #1 and #2	The boiler provides process steam to the Willowbrook II facility.

Attachment 2 - Acronyms and Abbreviations

acfm	Actual cubic feet per minute
ACMA	Alternative Compliance Market Account
Act	Illinois Environmental Protection Act [415 ILCS 5/1 et seq.]
AP-42	Compilation of Air Pollutant Emission Factors, Volume 1, Stationary Point and Other Sources (and Supplements A through F), USEPA, Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711
ATU	Allotment trading unit
BACT	Best Available Control Technology
BAT	Best Available Technology
Btu	British Thermal Units
CAA	Clean Air Act [42 U.S.C. Section 7401 et seq.]
CAAPP	Clean Air Act Permit Program
CAIR	Clean Air Interstate Rule
CAM	Compliance Assurance Monitoring
CEMS	Continuous Emission Monitoring System
CFR	Code of Federal Regulations
CISWI	Commercial Industrial Solid Waste Incinerator
CO	Carbon monoxide
CO_2	Carbon dioxide
COMS	Continuous Opacity Monitoring System
CPMS	Continuous Parameter Monitoring System
dscf	Dry standard cubic foot
dscm	Dry standard cubic meter
ERMS	Emissions Reduction Market System
°F	Degrees Fahrenheit
GHG	Green house gas
GACT	Generally Acceptable Control Technology
gr	Grains
HAP	Hazardous air pollutant
Hg	Mercury
HMIWI	Hospital medical infectious waste incinerator
hp	Horsepower
hr	Hour
H_2S	Hydrogen sulfide
I.D. No.	Identification number of source, assigned by IEPA
IAC	Illinois Administrative Code
ILCS	Illinois Compiled Statutes
IEPA	Illinois Environmental Protection Agency
kw	Kilowatts
LAER	Lowest Achievable Emission Rate
lbs	Pound

m	Meter
MACT	Maximum Achievable Control Technology
M	Thousand
MM	Million
mos	Month
MSDS	Material Safety Data Sheet
MSSCAM	Major Stationary Sources Construction and Modification (Non-attainment New Source Review)
MW	Megawatts
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_x	Nitrogen oxides
NSPS	New Source Performance Standards
NSR	New Source Review
PB	Lead
PEMS	Predictive Emissions Monitoring System
PM	Particulate matter
PM_{10}	Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 microns as measured by applicable test or monitoring methods
$PM_{2.5}$	Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 microns as measured by applicable test or monitoring methods
ppm	Parts per million
ppmv	Parts per million by volume
ppmw	Parts per million by weight
PSD	Prevention of Significant Deterioration
PSEU	Pollutant-Specific Emission Unit
psia	Pounds per square inch absolute
PTE	Potential to emit
RACT	Reasonable Available Control Technology
RMP	Risk Management Plan
scf	Standard cubic feet
SCR	Selective catalytic reduction
SIP	State Implementation Plan
SO_2	Sulfur dioxide
T1	Title I - identifies Title I conditions that have been carried over from an existing permit
T1N	Title I New - identifies Title I conditions that are being established in this permit
T1R	Title I Revised - identifies Title I conditions that have been carried over from an existing permit and subsequently revised in this permit
USEPA	United States Environmental Protection Agency
VOM	Volatile organic material

Attachment 3 - Contact and Reporting Addresses

IEPA Compliance Section	Illinois EPA, Bureau of Air Compliance & Enforcement Section (MC 40) 1021 North Grand Avenue East P.O. Box 19276 Springfield, Illinois 62794-9276 Phone No.: 217/782-2113
IEPA Stack Test Specialist	Illinois EPA, Bureau of Air Compliance Section Source Monitoring - Third Floor 9511 Harrison Street Des Plaines, Illinois 60016 Phone No.: 847/294-4000
IEPA Air Quality Planning Section	Illinois EPA, Bureau of Air Air Quality Planning Section (MC 39) 1021 North Grand Avenue East P.O. Box 19276 Springfield, Illinois 62794-9276 Phone No.: 217/782-2113
IEPA Air Regional Field Operations Regional Office #1	Illinois EPA, Bureau of Air Regional Office #1 9511 Harrison Street Des Plaines, Illinois 60016 Phone No.: 847/294-4000
IEPA Permit Section	Illinois EPA, Bureau of Air Permit Section (MC 11) 1021 North Grand Avenue East P.O. Box 19506 Springfield, Illinois 62794-9506 Phone No.: 217/785-1705
USEPA Region 5 - Air Branch	USEPA (AR - 17J) Air and Radiation Division 77 West Jackson Boulevard Chicago, Illinois 60604 Phone No.: 312/353-2000

Attachment 4 - Example Certification by a Responsible Official

SIGNATURE BLOCK	
NOTE: THIS CERTIFICATION MUST BE SIGNED BY A RESPONSIBLE OFFICIAL. APPLICATIONS WITHOUT A SIGNED CERTIFICATION WILL BE DEEMED AS INCOMPLETE.	
I CERTIFY UNDER PENALTY OF LAW THAT, BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION CONTAINED IN THIS APPLICATION ARE TRUE, ACCURATE AND COMPLETE. ANY PERSON WHO KNOWINGLY MAKES A FALSE, FICTITIOUS, OR FRAUDULENT MATERIAL STATEMENT, ORALLY OR IN WRITING, TO THE ILLINOIS EPA COMMITS A CLASS 4 FELONY. A SECOND OR SUBSEQUENT OFFENSE AFTER CONVICTION IS A CLASS 3 FELONY. (415 ILCS 5/44(H))	
AUTHORIZED SIGNATURE:	
BY: _____	_____
AUTHORIZED SIGNATURE	TITLE OF SIGNATORY
_____	_____ / _____ / _____
TYPED OR PRINTED NAME OF SIGNATORY	DATE

Message

From: Siegel, Kathryn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F57A52EFEAD9497CB582B11B8C85F09F-KSIEGE02]
Sent: 8/14/2018 8:47:09 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Rountree, Jillian [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7d304e5e55a54908b24b17e57ecdbf3c-JRountre]; Furey, Eileen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5aaa3a0ee58047d983897c53c1eb283e-EFurey]; Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Cohen, Eric [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=545800040a904d3e9ccfa22400b0f5fa-Eocohen]
CC: Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]
Subject: RE: Redrafted Willowbrook employees communication
Attachments: Willowbrook message 8-14-18.DOCX

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

From: Cain, Alexis
Sent: Tuesday, August 14, 2018 3:18 PM
To: Rountree, Jillian <Rountree.Jillian@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Cc: Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Redrafted Willowbrook employees communication

Deliberative Process / Ex. 5

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Rountree, Jillian
Sent: Tuesday, August 14, 2018 2:52 PM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Cc: Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Redrafted Willowbrook employees communication

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5
312-353-3849
Some of my email messages and attachments contain information that is privileged, confidential, or prohibited from disclosure under applicable law. If you believe you may have received this message in error, please inform the sender immediately. Further, do not read, print, or distribute any messages or attachments received in error. Immediately delete and otherwise destroy any such messages and attachments. Thank you.

From: Siegel, Kathryn
Sent: Tuesday, August 14, 2018 2:37 PM
To: Furey, Eileen <furey.eileen@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Cc: Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Redrafted Willowbrook employees communication

Deliberative Process / Ex. 5

From: Furey, Eileen
Sent: Tuesday, August 14, 2018 2:33 PM
To: Nam, Ed <nam.ed@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Redrafted Willowbrook employees communication

Deliberative Process / Ex. 5

ELF

Eileen L. Furey
Deputy Director
Air and Radiation Division
U.S. EPA Region 5
(312) 886-7950

From: Nam, Ed
Sent: Tuesday, August 14, 2018 2:28 PM
To: Cohen, Eric <cohen.eric@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Redrafted Willowbrook employees communication

Deliberative Process / Ex. 5

-Ed

From: Cohen, Eric
Sent: Tuesday, August 14, 2018 2:22 PM
To: Furey, Eileen <furey.eileen@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Redrafted Willowbrook employees communication

Deliberative Process / Ex. 5

From: Furey, Eileen
Sent: Tuesday, August 14, 2018 1:52 PM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Subject: Redrafted Willowbrook employees communication

Ed –

Deliberative Process / Ex. 5

Eileen

Eileen L. Furey
Deputy Director
Air and Radiation Division
U.S. EPA Region 5
(312) 886-7950

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, DIRECTOR

217/785-1705

CONSTRUCTION PERMIT
NESHAP SOURCE

PERMITTEE

Sterigenics US, LLC
Attn: Laura Hartman, EHS Manager
2015 Spring Road, Suite 650
Oak Brook, Illinois 60523

Application No.: 18060020 I.D. No.: 043110AAC
Applicant's Designation: Date Received: June 11, 2018
Subject: Control of the Backvents of the Sterilization Chambers
Date Issued: June 26, 2018
Location: 7775 Quincy and 830 Midway, Willowbrook, DuPage County

This Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of control of the backvents of the sterilization chambers, as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1. Introduction

   a. This permit authorizes control of the existing backvents of the five sterilization chambers (SC-1, SC-2, SC-3, SC-4 and SC-5) at Sterigenic's Willowbrook facilities using the existing control systems that control emissions of ethylene oxide from the vacuum pumps and from aeration.

   b. This permit does not authorize changes to the sterilization chambers or other emission units at the source that would increase their capacity or emissions.

   c. For purposes of this permit, the existing sterilization chambers after their backvents are also connected to control systems are referred to as the "affected units."

2. Existing Requirements

   This permit does alter established requirements for the affected units, (i.e., applicable emission standards and requirements for testing, monitoring, recordkeeping and reporting), as identified in Sections 4.1 and 4.2 of the Clean Air Act Permit Program (CAAPP) permit for the source, Permit No. 95120085, issued June 8, 2015. In particular, the affected units will continue to be subject to federal National Emission Standards for Hazardous Air Pollutants (NESHAP) for Ethylene Oxide Emissions from Sterilization Facilities, 40 CFR 63 Subpart O.

3. Non-applicability Provisions

This permit is issued based on this project not constituting a major modification for purposes of the state rules for Major Stationary Sources Construction and Modification (MSSCAM), 35 IAC Part 203. This is because this project is an emission reduction project that will reduce emissions of volatile organic material.

4. Good Air Pollution Control Practices

At all times, the Permittee shall maintain and operate the affected units and associated air pollution control systems in a manner consistent with good air pollution control practices for minimizing emissions.

5. Notification

The Permittee shall notify the Illinois EPA within 30 days after completion of this project. This notification shall include the date that the backvent on each affected unit is first controlled.

6. Testing

a. Within 180 days of completion of this project, for the affected units, the Permittee shall perform performance testing in accordance with 40 CFR 63.365 and 63.7. The Permittee shall submit applicable notifications and reports for this testing as required by 40 CFR 63.7, 63.360, 63.365 and 63.366.

b. The following USEPA methods and procedures shall be used for testing, unless another USEPA method is approved by the Illinois EPA:

Flowrate	Method 2, 2A, 2B, 2C or 2D
Oxygen (O_2)/Carbon Dioxide (CO_2)	Method 3A or 3B
Moisture	Method 4 or 320
Ethylene Oxide/Propylene Oxide	Method 18 or 320

c. The Permittee shall submit a written test plan to the Illinois EPA for this testing and if a significant change in the procedures for this testing is planned from the procedures followed in the previous test. This plan shall be submitted at least 30 days prior to the actual date of testing and include the following information as a minimum:

i. A description of the planned test procedures.

ii. The person(s) who will be performing sampling and analysis and their experience with similar tests.

iii. The specific conditions under which testing will be performed, including a discussion of why these conditions will be representative of maximum emissions and the means or manner by which the operating parameters for the emission unit and any control equipment will be determined.

iv. The specific determinations of emissions and operation that are intended to be made, including sampling and monitoring locations.

v. The test method(s) that will be used, with the specific analysis method, if the method can be used with different analysis methods.

d. The Permittee shall notify the Illinois EPA prior to conducting these measurements to enable the Illinois EPA to observe testing. Notification for the expected date of testing shall be submitted a minimum of 30 days prior to the expected date. Notification of the actual date and expected time of testing shall be submitted a minimum of 5 working days prior to the actual date of the test. The Illinois EPA may accept shorter advance notice if it does not interfere with the Illinois EPA's ability to observe testing.

e. Copies of the Final Report(s) for these tests shall be submitted to the Illinois EPA within 30 days after the test results are compiled and finalized but no later than 60 days after completion of sampling. The Final Report shall include as a minimum:

i. General information, i.e., date of test, names of testing personnel, and names of Illinois EPA observers.

ii. A summary of results, e.g., VOM emissions, pounds.

iii. A detailed description of operating conditions of the emission unit(s) during testing, including:

A. Process information, i.e., mode(s) of operation, process rate, e.g. fuel or raw material consumption.

B. Control equipment information, i.e., equipment condition and operating parameters during testing.

C. A discussion of any preparatory actions taken, i.e., inspections, maintenance and repair.

iv. Description of test method(s), including description of sampling points, sampling train, analysis equipment, and test schedule.

v. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration.

vi. Conclusions.

f. The Permittee shall retain copies of emission test reports for at least three years beyond the date that an emission test is superseded by a more recent test.

7. <u>Authorization to Operate</u>

The Permittee may operate the affected units with backvents ducted to the existing control systems pursuant to this construction permit until the CAAPP permit for the source is revised to address this project. This condition supersedes Standard Condition 6.

Please note that the Illinois EPA has not acted in this permit on Sterigenic's request for enforceable limits on the operation and emissions of its Willowbrook facilities so that this source is not a major source under relevant air pollution control regulations. The Illinois EPA is processing that request as a separate application.

If you have any questions on this permit, please contact Daniel Rowell at 217/558-4368.

Raymond E. Pilapil
Manager, Permit Section
Bureau of Air

REP:DBR:jlp

DBR
6/26/18

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL
P. O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

STANDARD CONDITIONS FOR CONSTRUCTION/DEVELOPMENT PERMITS ISSUED BY THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

July 1, 1985

The Illinois Environmental Protection Act (Illinois Revised Statutes, Chapter 111-1/2, Section 1039) authorizes the Environmental Protection Agency to impose conditions on permits which it issues.

The following conditions are applicable unless superseded by special condition(s).

1. Unless this permit has been extended or it has been voided by a newly issued permit, this permit will expire one year from the date of issuance, unless a continuous program of construction or development on this project has started by such time.

2. The construction or development covered by this permit shall be done in compliance with applicable provisions of the Illinois Environmental Protection Act, and Regulations adopted by the Illinois Pollution Control Board.

3. There shall be no deviations from the approved plans and specifications unless a written request for modification, along with plans and specifications as required, shall have been submitted to the Agency and a supplemental written permit issued.

4. The Permittee shall allow any duly authorized agent of the Agency upon the presentation of credentials, at reasonable times:

   a. to enter the Permittee's property where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit,

   b. to have access to and copy any records required to be kept under the terms and conditions of this permit,

   c. to inspect, including during any hours of operation of equipment constructed or operated under this permit, such equipment and any equipment required to be kept, used, operated, calibrated and maintained under this permit,

   d. to obtain and remove samples of any discharge or emission of pollutants, and

   e. to enter and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring, or recording any activity, discharge, or emission authorized by this permit.

5. The issuance of this permit:

   a. shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are to be located,

   b. does not release the Permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the proposed facilities,

   c. does not release the Permittee from compliance with the other applicable statues and regulations of the United States, of the State of Illinois, or with applicable local laws, ordinances and regulations,

   d. does not take into consideration or attest to the structural stability of any units or parts of the project, and

e. in no manner implies or suggests that the Agency (or its officers, agents or employees) assumes any liability, directly or indirectly, for any loss due to damage, installation, maintenance, or operation of the proposed equipment or facility.

6. a. Unless a joint construction/operation permit has been issued, a permit for operation shall be obtained from the Agency before the equipment covered by this permit is placed into operation.

   b. For purposes of shakedown and testing, unless otherwise specified by a special permit condition, the equipment covered under this permit may be operated for a period not to exceed thirty (30) days.

7. The Agency may file a complaint with the Board for modification, suspension or revocation of a permit:

   a. upon discovery that the permit application contained misrepresentations, misinformation or false statements or that all relevant facts were not disclosed, or

   b. upon finding that any standard or special conditions have been violated, or

   c. upon any violations of the Environmental Protection Act or any regulation effective thereunder as a result of the construction or development authorized by this permit.

Message

From: Siegel, Kathryn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F57A52EFEAD9497CB582B11B8C85F09F-KSIEGE02]
Sent: 8/10/2018 9:28:47 PM
To: Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]
CC: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Furey, Eileen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5aaa3a0ee58047d983897c53c1eb283e-EFurey]
Subject: RE: Materials

Deliberative Process / Ex. 5

-----Original Message-----
From: Nam, Ed
Sent: Friday, August 10, 2018 4:18 PM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>
Cc: Cain, Alexis <cain.alexis@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Subject: FW: Materials

Katie,

Deliberative Process / Ex. 5

Thanks
-Ed

-----Original Message-----
From: Thiede, Kurt
Sent: Friday, August 10, 2018 4:16 PM
To: Kelley, Jeff <kelley.jeff@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Cc: Stepp, Cathy <stepp.cathy@epa.gov>; Payne, James <payne.james@epa.gov>
Subject: Materials

Ed and Jeff,

Deliberative Process / Ex. 5

Thank you!

Kurt Thiede
Chief of Staff
EPA Region 5

Sent from my iPhone...please excuse my typos.

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 6/27/2018 2:05:24 PM
To: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Nwia, Jacqueline [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d299b56bd7ef46709fb7465fd1e15466-JNwia]; Nguyen, Phuong [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f07188263d014e06a28762ccf129ce20-PNguyen]; Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]
Subject: docs for call
Attachments: Sterigenics Conference Call 6 27 18.docx; 20180131 Sterigenics Modeling Parameters email.pdf

I put this together based on the email so we could follow and have a bit of room to write answers on from the call.

-Margaret

From: Sieffert, Margaret
To: kwagner@sterigenics.com
Subject: Sterigenics Modeling Parameters
Date: Wednesday, January 31, 2018 9:55:00 AM

Kevin,

Thank you again for agreeing to review the modeling information pertaining to the Willowbrook facility. Per our conversation, below are the questions to try and correct regarding the modeling parameters. We provided some information on the second building for your review but know that EPA only has all emissions coming from one of the buildings.

EPA used google earth to obtain these values. Let us know if Sterigenics is in agreement with them.
-For building #1's address (7775 Quincy St., Willow brook, IL), please verify building #1's corners (lat/long) and building height.
lat/long. Building height of 23.2 feet.
1. 41.748181; -87.939061
2. 41.748163; -87.939499
3. 41.748141; -87.939500
4. 41.748124; -87.940454
5. 41.748006; -87.940453
6. 41.748001; -87.940513
7. 41.747787; -87.940508
8. 41.747786; -87.940444
9. 41.747667; -87.940441
10. 41.747674; -87.939042

EPA would like to separate the emissions by building. Again we used google earth to obtain these values. For building #2's address (830 Midway Dr. Willowbrook, IL), please verify building #2's corners (lat/long) and building height:
lat/long Building height of 12.3 feet
1. 41.748865; -87.941666
2. 41.748877; -87.941221
3. 41.748956; -87.941226
4. 41.748945; -87.941667

Sterigenics/IEPA has the 6 listed stacks in the same location at the following lat/long located withing building #1's area: lat (41.747990) ; long (-87.939730). For modeling purposes, our modeler had to move these stacks 1.0 meter apart as shown below in the table. We are pretty sure that the stacks aren't located at these locations, so if you can provide the lat/long for each of the stacks, or if easier you can mark each stacks location for building 1 and 2 on a map (created using google maps or something similar) and share a screenshot. Also for modeling purposes, EPA has the facility operating 24/7 for 365 days but if this is incorrect, please let us know your annual operating hours.

For each stack that emits EtO, EPA needs the following information: stack lat/long, stack emission rate, stack height, stack exit temperature, stack flow rate, stack diameter, and if the stack is vertical or horizontal. Do you have process fugitive emissions not ducted to a vent or stack not listed in table below? Table below lists the input parameters we used in the modeling. The stack parameter information could be found in a permit application, a stack test, or from manufacturer specifications. With regard to the projected facility emissions after the back vent project, please provide the same information.

Unit ID	Process ID	Stack ID	Lat	Long	2014 Emission Rate (TPY)	Stack Height (m)	Stack Temperature (k)	Stack Exit Velocity (m/s)	Stack Diameter (m)	Vertical or Horizontal Stack?
39469613	45489714	Stack#1	41.747989	-87.939729	0.030576	12.192	308.15	2.29	0.229	V
39469713	45489614	Stack#2	41.747989	-87.939741	0.069888	12.192	308.15	2.29	0.229	V
39469813	45489514	Stack#3	41.747989	-87.939753	1.39776	12.497	310.90	4.69	0.372	V
39469913	45489414	Stack#4	41.747998	-87.939729	0.6552	12.497	310.90	4.69	0.372	V
39470013	45489314	Stack#5	41.748007	-87.939729	0.00056784	10.058	293.00	11.14	0.914	V

39470113	45489214	Stack#6	41.74798	-87.939729	0.62899	12.912	308.15	2.29	0.229	V

Finally, could you provide a property boundary of the facility that includes both buildings? This could be as simple as marking up a map (created using google maps or something similar) and sharing a screenshot.

Not sure how long this will take you to review, but suggests a potential completion date of February 23. If you need additional time, please let me know. Thank you again for your assistance in reviewing the modeling parameters and please don't hesitate to email or call me if you have any questions,

Margaret

Margaret Sieffert | U.S. Environmental Protection Agency R5
Air & Radiation Division | Air Toxics and Assessment Branch
77 W. Jackson Blvd. (AT-18J) | Chicago, IL 60604 | 312.353.1151

Message

From: Siegel, Kathryn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F57A52EFEAD9497CB582B11B8C85F09F-KSIEGE02]
Sent: 12/14/2017 9:15:18 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: Deliberative Process / Ex. 5
Attachments:

Alexis, my comments are attached. I'll set up a pre-meeting with Ed for Monday.

From: Cain, Alexis
Sent: Tuesday, December 12, 2017 12:05 PM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nguyen, Phuong <Nguyen.Phuong@epa.gov>; Bollweg, George <bollweg.george@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Sieffert, Margaret
Sent: Tuesday, December 12, 2017 11:05 AM
To: Cain, Alexis <cain.alexis@epa.gov>; Nguyen, Phuong <Nguyen.Phuong@epa.gov>; Bollweg, George <bollweg.george@epa.gov>
Subject: Deliberative Process / Ex. 5

I have a few questions/comments.

-Margaret

From: Cain, Alexis
Sent: Monday, December 11, 2017 1:49 PM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nguyen, Phuong <Nguyen.Phuong@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

Message

From: Siegel, Kathryn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F57A52EFEAD9497CB582B11B8C85F09F-KSIEGE02]
Sent: 6/21/2018 12:01:28 AM
To: Sanders, Amy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c8c3424e1c874447aa2629c6ebed66f3-ASande02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
CC: Kelley, Jeff [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e154fa5a5f744c70aa3da58e3f87aabe-JKelley]; Newton, Cheryl [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ae08c2f1c2304a61bf7c01de62f35dbf-Cenewton]; Colvin, Charles [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c545c36562d04373add64046e1c419a7-CColvin]; Sharon, Scott [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=870d4956af81499dbba2328fd28c6c75-SSharon]; Glover, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3e2fa892e38e45a9a65ce871242e8c62-JGlover]; Short, Thomas [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=06e6366deab241b7b204d2d8415f9cbf-TShort]; Zamora-Ceballos, Maria [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ff50fe12266d4cd58845c9124fc01ac3-MZamora]
Subject: RE: Draft internal talking points
Attachments: Internal talking points_ARD comments.docx

Please find ARD's comments on the talking points attached. Let us know if you have any questions. Thanks!

Katie Siegel, Chief
Air Toxics and Assessment Branch
Air and Radiation Division
U.S. EPA Region 5
siegel.kathryn@epa.gov
(312) 886-3006

From: Sanders, Amy
Sent: Wednesday, June 20, 2018 4:59 PM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Cc: Kelley, Jeff <kelley.jeff@epa.gov>; Newton, Cheryl <Newton.Cheryl@epa.gov>; Colvin, Charles <Colvin.Charles@epa.gov>; Sharon, Scott <sharon.scott@epa.gov>; Glover, John <Glover.John@epa.gov>; Short, Thomas <short.thomas@epa.gov>; Zamora-Ceballos, Maria <Zamora-Ceballos.Maria@epa.gov>
Subject: FW: Draft internal talking points

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Message

From: Ogulei, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=C3E66FB31CD74EDB89554389D19D6977-DOGULEI]
Sent: 7/10/2018 9:59:02 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
CC: Furey, Eileen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5aaa3a0ee58047d983897c53c1eb283e-EFurey]; Olson, Erik [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b05e7846315e4bf4b9d0df0afdb3eb43-EOlson02]; Rountree, Jillian [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7d304e5e55a54908b24b17e57ecdbf3c-JRountre]; Biggs, Christopher [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2a627bf68c7f4b9188524bcb13979737-Biggs, Chri]; Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Marcus, Danny [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a34c75d25a6243e68733a8ee7e2ddf82-DMarcus]
Subject: RE: Sterigenics, July 18

Alexis,

I will be in the office so I can hop in the car with you.

David

From: Cain, Alexis
Sent: Tuesday, July 10, 2018 2:29 PM
To: Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Ogulei, David <Ogulei.David@epa.gov>; Marcus, Danny <marcus.danny@epa.gov>
Cc: Furey, Eileen <furey.eileen@epa.gov>; Olson, Erik <olson.erik@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Biggs, Christopher <biggs.christopher@epa.gov>
Subject: Sterigenics, July 18

We are tentatively scheduled to visit Sterigenics in Willowbrook on Wednesday, July 18, arriving at 10:00. I believe that the people going are:

Deliberative Process / Ex. 5

If there's anyone else who should go, please let me know.

Deliberative Process / Ex. 5

I'm working on getting a car. We'll need to leave from the office not much after 9:00. If you're going to the meeting, but will go directly from home, please let me know that.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 8/6/2018 8:37:30 PM
To: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: EtO docs
Attachments: steregenics-web-outline-draft 8 6 18.docx; Sterigenics Talking points draft 8 6 18.docx

I updated the talking points and web page but wasn't sure how to add the ATSDR part. Attached are both documents. You can review previous version with the comments on the sharepoint site.

-Margaret

Message

From: Marcus, Danny [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A34C75D25A6243E68733A8EE7E2DDF82-DMARCUS]
Sent: 7/10/2018 2:32:19 PM
To: Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Rountree, Jillian [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7d304e5e55a54908b24b17e57ecdbf3c-JRountre]
CC: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
Subject: RE: June 27 EPA/IEPA/Sterigenics meeting
Attachments: Sterigenics (043110AAC)(18060020) 062618.pdf

All,

Here is a pdf version of the issued construction permit.
Thanks.

Danny.

From: Marcus, Danny
Sent: Monday, July 9, 2018 9:17 AM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>
Cc: Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: RE: June 27 EPA/IEPA/Sterigenics meeting

All,

Attorney Client / Ex. 5

Thanks.

Danny.

From: Sieffert, Margaret
Sent: Friday, July 6, 2018 1:54 PM
To: Rountree, Jillian <Rountree.Jillian@epa.gov>; Marcus, Danny <marcus.danny@epa.gov>
Cc: Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: RE: June 27 EPA/IEPA/Sterigenics meeting

Attorney Client / Ex. 5

-Margaret

From: Rountree, Jillian
Sent: Tuesday, July 03, 2018 3:06 PM
To: Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nguyen, Phuong <Nguyen.Phuong@epa.gov>; Marcus, Danny <marcus.danny@epa.gov>
Subject: RE: June 27 EPA/IEPA/Sterigenics meeting

Attorney Client / Ex. 5

Jill

Jillian Rountree
Associate Regional Counsel
U.S. EPA Region 5
Office of Regional Counsel
77 W. Jackson Blvd. (C-14J)
Chicago, Illinois 60604
312-353-3849
rountree.jillian@epa.gov

Some of my email messages and attachments contain information that is privileged, confidential, or prohibited from disclosure under applicable law. If you believe you may have received this message in error, please inform the sender immediately. Further, do not read, print, or distribute any messages or attachments received in error. Immediately delete and otherwise destroy any such messages and attachments. Thank you.

From: Cain, Alexis
Sent: Thursday, June 28, 2018 1:43 PM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Nguyen, Phuong <Nguyen.Phuong@epa.gov>; Marcus, Danny <marcus.danny@epa.gov>
Cc: Damico, Genevieve <damico.genevieve@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>
Subject: RE: June 27 EPA/IEPA/Sterigenics meeting

Deliberative Process / Ex. 5

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Cain, Alexis
Sent: Thursday, June 28, 2018 1:33 PM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Nguyen, Phuong <Nguyen.Phuong@epa.gov>; Marcus, Danny <marcus.danny@epa.gov>
Cc: Damico, Genevieve <damico.genevieve@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>
Subject: RE: June 27 EPA/IEPA/Sterigenics meeting

Phuong has recently completed some preliminary modeling to determine what level of emissions reductions would be necessary in order to bring risk levels down to possibly-acceptable levels (less than 100 in a million) for the maximum exposed individual (at a home).

Previously modeling, which showed a risk of more than 1000 in a million a nearby home, was based on emission rates from NATA 2014. Total Annual Emissions= 2.7829TPY

Deliberative Process / Ex. 5

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Siegel, Kathryn
Sent: Thursday, June 28, 2018 12:33 PM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Nguyen, Phuong <Nguyen.Phuong@epa.gov>; Marcus, Danny <marcus.danny@epa.gov>
Cc: Cain, Alexis <cain.alexis@epa.gov>; Damico, Genevieve <damico.genevieve@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>
Subject: FW: June 27 EPA/IEPA/Sterigenics meeting

sharing with the team…thanks!

From: Hoffman, Kathy [mailto:KHoffman@sterigenics.com]
Sent: Thursday, June 28, 2018 11:58 AM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Armitage, Julie <Julie.Armitage@Illinois.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Wagner, Kevin <KWagner@sterigenics.com>
Subject: RE: June 27 EPA/IEPA/Sterigenics meeting

Ed:

Thank you for coordinating the call and the follow-up notes.

Attached is a summary of the Willowbrook emissions before and after the backvent connection project that we discussed. The top part of the spreadsheet estimates the maximum potential to emit, using permitted usage amounts and required control efficiencies. The bottom part of the spreadsheet estimates the actual emissions, using current 2017 usage amounts and the control efficiencies from the last compliance test. Both portions of the spreadsheet include our process emissions as well as an estimate of the fugitive emissions.

In addition, I wanted to reiterate our projected timeline for the backvent connection construction project. As indicated during the call yesterday, we estimate that this project will take from 4 to 6 weeks from yesterday. I will provide weekly updates to you on this project.

We are working on the other commitments we agreed to during the meeting.

Let me know if you have any questions on the information provided.

Regards,
Kathy

Kathleen Hoffman
Senior Vice President - Global Environmental, Health & Safety and Technical Services
Sterigenics, A Sotera Health Company
2015 Spring Road, Suite 650
Oak Brook, IL 60523
Office: 630.928.1758
khoffman@sterigenics.com

From: Nam, Ed [mailto:nam.ed@epa.gov]
Sent: Thursday, June 28, 2018 10:09 AM
To: Hoffman, Kathy
Cc: Cain, Alexis; Siegel, Kathryn; Armitage, Julie; Rountree, Jillian
Subject: June 27 EPA/IEPA/Sterigenics meeting

Kathy,

Thank you again for your participation in a first, very productive conference call. We look forward to future meetings, including a presentation and a tour of the Willowbrook facility.

Here is our understanding of the commitments that we made on the call to provide information to you:

- The met data collected during our monitoring efforts in May 2018
- The met data used in the modeling
- The modeling plot files

Alexis Cain provided these in a separate email. Please let me know if there are remaining questions we can address.

Here is our understanding of the commitments that you made to provide information to us:

- Emissions calculations, including fugitive emissions (before and after construction)
- A review of the modeling parameters we used
- A review of the proposed OAQPS monitoring plan
- A description of operations, process flow, cycle times, facility map
- A timeline for the construction project, when available.

My staff will be in contact about scheduling a next meeting and tour.

Thank you,
-Ed

-Edward Nam, PhD
Director, Air and Radiation Division
US EPA, Region 5, Mail code A-18J
77 W. Jackson Blvd.
Chicago, IL 60604-3590
Phone 312-353-2192 nam.ed@epa.gov

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, DIRECTOR

217/785-1705

CONSTRUCTION PERMIT
NESHAP SOURCE

PERMITTEE

Sterigenics US, LLC
Attn: Laura Hartman, EHS Manager
2015 Spring Road, Suite 650
Oak Brook, Illinois 60523

Application No.: 18060020 I.D. No.: 043110AAC
Applicant's Designation: Date Received: June 11, 2018
Subject: Control of the Backvents of the Sterilization Chambers
Date Issued: June 26, 2018
Location: 7775 Quincy and 830 Midway, Willowbrook, DuPage County

This Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of control of the backvents of the sterilization chambers, as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1. Introduction

   a. This permit authorizes control of the existing backvents of the five sterilization chambers (SC-1, SC-2, SC-3, SC-4 and SC-5) at Sterigenic's Willowbrook facilities using the existing control systems that control emissions of ethylene oxide from the vacuum pumps and from aeration.

   b. This permit does not authorize changes to the sterilization chambers or other emission units at the source that would increase their capacity or emissions.

   c. For purposes of this permit, the existing sterilization chambers after their backvents are also connected to control systems are referred to as the "affected units."

2. Existing Requirements

   This permit does alter established requirements for the affected units, (i.e., applicable emission standards and requirements for testing, monitoring, recordkeeping and reporting), as identified in Sections 4.1 and 4.2 of the Clean Air Act Permit Program (CAAPP) permit for the source, Permit No. 95120085, issued June 8, 2015. In particular, the affected units will continue to be subject to federal National Emission Standards for Hazardous Air Pollutants (NESHAP) for Ethylene Oxide Emissions from Sterilization Facilities, 40 CFR 63 Subpart O.

3. Non-applicability Provisions

This permit is issued based on this project not constituting a major modification for purposes of the state rules for Major Stationary Sources Construction and Modification (MSSCAM), 35 IAC Part 203. This is because this project is an emission reduction project that will reduce emissions of volatile organic material.

4. Good Air Pollution Control Practices

At all times, the Permittee shall maintain and operate the affected units and associated air pollution control systems in a manner consistent with good air pollution control practices for minimizing emissions.

5. Notification

The Permittee shall notify the Illinois EPA within 30 days after completion of this project. This notification shall include the date that the backvent on each affected unit is first controlled.

6. Testing

a. Within 180 days of completion of this project, for the affected units, the Permittee shall perform performance testing in accordance with 40 CFR 63.365 and 63.7. The Permittee shall submit applicable notifications and reports for this testing as required by 40 CFR 63.7, 63.360, 63.365 and 63.366.

b. The following USEPA methods and procedures shall be used for testing, unless another USEPA method is approved by the Illinois EPA:

Flowrate	Method 2, 2A, 2B, 2C or 2D
Oxygen (O_2)/Carbon Dioxide (CO_2)	Method 3A or 3B
Moisture	Method 4 or 320
Ethylene Oxide/Propylene Oxide	Method 18 or 320

c. The Permittee shall submit a written test plan to the Illinois EPA for this testing and if a significant change in the procedures for this testing is planned from the procedures followed in the previous test. This plan shall be submitted at least 30 days prior to the actual date of testing and include the following information as a minimum:

i. A description of the planned test procedures.

ii. The person(s) who will be performing sampling and analysis and their experience with similar tests.

iii. The specific conditions under which testing will be performed, including a discussion of why these conditions will be representative of maximum emissions and the means or manner by which the operating parameters for the emission unit and any control equipment will be determined.

iv. The specific determinations of emissions and operation that are intended to be made, including sampling and monitoring locations.

v. The test method(s) that will be used, with the specific analysis method, if the method can be used with different analysis methods.

d. The Permittee shall notify the Illinois EPA prior to conducting these measurements to enable the Illinois EPA to observe testing. Notification for the expected date of testing shall be submitted a minimum of 30 days prior to the expected date. Notification of the actual date and expected time of testing shall be submitted a minimum of 5 working days prior to the actual date of the test. The Illinois EPA may accept shorter advance notice if it does not interfere with the Illinois EPA's ability to observe testing.

e. Copies of the Final Report(s) for these tests shall be submitted to the Illinois EPA within 30 days after the test results are compiled and finalized but no later than 60 days after completion of sampling. The Final Report shall include as a minimum:

i. General information, i.e., date of test, names of testing personnel, and names of Illinois EPA observers.

ii. A summary of results, e.g., VOM emissions, pounds.

iii. A detailed description of operating conditions of the emission unit(s) during testing, including:

A. Process information, i.e., mode(s) of operation, process rate, e.g. fuel or raw material consumption.

B. Control equipment information, i.e., equipment condition and operating parameters during testing.

C. A discussion of any preparatory actions taken, i.e., inspections, maintenance and repair.

iv. Description of test method(s), including description of sampling points, sampling train, analysis equipment, and test schedule.

v. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration.

vi. Conclusions.

f. The Permittee shall retain copies of emission test reports for at least three years beyond the date that an emission test is superseded by a more recent test.

7. <u>Authorization to Operate</u>

The Permittee may operate the affected units with backvents ducted to the existing control systems pursuant to this construction permit until the CAAPP permit for the source is revised to address this project. This condition supersedes Standard Condition 6.

Please note that the Illinois EPA has not acted in this permit on Sterigenic's request for enforceable limits on the operation and emissions of its Willowbrook facilities so that this source is not a major source under relevant air pollution control regulations. The Illinois EPA is processing that request as a separate application.

If you have any questions on this permit, please contact Daniel Rowell at 217/558-4368.

Raymond E. Pilapil
Manager, Permit Section
Bureau of Air

REP:DBR:jlp

DBR
6/26/18

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL
P. O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

STANDARD CONDITIONS FOR CONSTRUCTION/DEVELOPMENT PERMITS ISSUED BY THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

July 1, 1985

The Illinois Environmental Protection Act (Illinois Revised Statutes, Chapter 111-1/2, Section 1039) authorizes the Environmental Protection Agency to impose conditions on permits which it issues.

The following conditions are applicable unless superseded by special condition(s).

1. Unless this permit has been extended or it has been voided by a newly issued permit, this permit will expire one year from the date of issuance, unless a continuous program of construction or development on this project has started by such time.

2. The construction or development covered by this permit shall be done in compliance with applicable provisions of the Illinois Environmental Protection Act, and Regulations adopted by the Illinois Pollution Control Board.

3. There shall be no deviations from the approved plans and specifications unless a written request for modification, along with plans and specifications as required, shall have been submitted to the Agency and a supplemental written permit issued.

4. The Permittee shall allow any duly authorized agent of the Agency upon the presentation of credentials, at reasonable times:

   a. to enter the Permittee's property where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit,

   b. to have access to and copy any records required to be kept under the terms and conditions of this permit,

   c. to inspect, including during any hours of operation of equipment constructed or operated under this permit, such equipment and any equipment required to be kept, used, operated, calibrated and maintained under this permit,

   d. to obtain and remove samples of any discharge or emission of pollutants, and

   e. to enter and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring, or recording any activity, discharge, or emission authorized by this permit.

5. The issuance of this permit:

   a. shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are to be located,

   b. does not release the Permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the proposed facilities,

   c. does not release the Permittee from compliance with the other applicable statues and regulations of the United States, of the State of Illinois, or with applicable local laws, ordinances and regulations,

   d. does not take into consideration or attest to the structural stability of any units or parts of the project, and

e. in no manner implies or suggests that the Agency (or its officers, agents or employees) assumes any liability, directly or indirectly, for any loss due to damage, installation, maintenance, or operation of the proposed equipment or facility.

6. a. Unless a joint construction/operation permit has been issued, a permit for operation shall be obtained from the Agency before the equipment covered by this permit is placed into operation.

   b. For purposes of shakedown and testing, unless otherwise specified by a special permit condition, the equipment covered under this permit may be operated for a period not to exceed thirty (30) days.

7. The Agency may file a complaint with the Board for modification, suspension or revocation of a permit:

   a. upon discovery that the permit application contained misrepresentations, misinformation or false statements or that all relevant facts were not disclosed, or

   b. upon finding that any standard or special conditions have been violated, or

   c. upon any violations of the Environmental Protection Act or any regulation effective thereunder as a result of the construction or development authorized by this permit.

Message

From: Kelley, Jeff [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E154FA5A5F744C70AA3DA58E3F87AABE-JKELLEY]
Sent: 8/10/2018 5:02:21 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Rountree, Jillian [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7d304e5e55a54908b24b17e57ecdbf3c-JRountre]; Singer, Joshua [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f29c3a13f65447ae887edd3bdc89d77a-JSinge02]; Furey, Eileen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5aaa3a0ee58047d983897c53c1eb283e-EFurey]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]
Subject: RE: DRAFT Sterigenics News Release
Attachments: 20180809-sterigenic_news_release-v2.1.docx

Deliberative Process / Ex. 5

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

From: Kelley, Jeff
Sent: Friday, August 10, 2018 11:31 AM
To: Cain, Alexis <cain.alexis@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Singer, Joshua <Singer.Joshua@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Subject: RE: DRAFT Sterigenics News Release

Here's a clean version … at least for now, **Deliberative Process / Ex. 5 & Attorney Client / Ex. 5**

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

From: Kelley, Jeff
Sent: Friday, August 10, 2018 11:14 AM
To: Cain, Alexis <cain.alexis@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Singer, Joshua <Singer.Joshua@epa.gov>
Cc: Furey, Eileen <furey.eileen@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Subject: RE: DRAFT Sterigenics News Release

Let me take the pen here to try to synthesize comments and send around a clean version.

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

From: Cain, Alexis
Sent: Friday, August 10, 2018 11:08 AM
To: Rountree, Jillian <Rountree.Jillian@epa.gov>; Singer, Joshua <Singer.Joshua@epa.gov>
Cc: Furey, Eileen <furey.eileen@epa.gov>; Kelley, Jeff <kelley.jeff@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Subject: RE: DRAFT Sterigenics News Release

Some comments on the comments.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Rountree, Jillian
Sent: Friday, August 10, 2018 10:07 AM
To: Singer, Joshua <Singer.Joshua@epa.gov>
Cc: Furey, Eileen <furey.eileen@epa.gov>; Kelley, Jeff <kelley.jeff@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Subject: RE: DRAFT Sterigenics News Release

Hello,

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Jill

ATTORNEY CLIENT PRIVILEGED; DELIBERATIVE

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5

77 W. Jackson Blvd. (C-14J), Cube 18010
Chicago, Illinois 60604
312-353-3849
rountree.jillian@epa.gov

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From: Nam, Ed
Sent: Friday, August 10, 2018 8:08 AM
To: Singer, Joshua <Singer.Joshua@epa.gov>
Cc: Furey, Eileen <furey.eileen@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Kelley, Jeff <kelley.jeff@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: Re: DRAFT Sterigenics News Release

There is a newer version with Cathy and Kuts additions. We will send around soon after cleaning it up a bit
Ed

Sent from my iPhone

On Aug 9, 2018, at 5:08 PM, Singer, Joshua <Singer.Joshua@epa.gov> wrote:

> Ed and Eileen and Jill,
>
> Please review the draft press release attached and below. Please let me know if this looks OK or if any changes are needed. Thank you.
>
> Josh Singer
> U.S. EPA, Region 5
> phone: 312-353-5069
> singer.joshua@epa.gov
>
> <image001.jpg>

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Message

From: Nam, Ed [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A2653F1DDD59470688BA557DD84D9690-NAM, ED]
Sent: 8/10/2018 4:44:13 PM
To: Kelley, Jeff [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e154fa5a5f744c70aa3da58e3f87aabe-JKelley]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
CC: Furey, Eileen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5aaa3a0ee58047d983897c53c1eb283e-EFurey]
Subject: RE: Draft Sterigenics news release

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

From: Kelley, Jeff
Sent: Friday, August 10, 2018 10:57 AM
To: Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Cc: Furey, Eileen <furey.eileen@epa.gov>
Subject: RE: Draft Sterigenics news release

Deliberative Process / Ex. 5

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

From: Nam, Ed
Sent: Friday, August 10, 2018 7:53 AM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Cc: Kelley, Jeff <kelley.jeff@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Subject: Fwd: Draft Sterigenics news release

Katie, Alexis

Deliberative Process / Ex. 5

Thanks
Ed

Sent from my iPhone

Begin forwarded message:

From: "Thiede, Kurt" <thiede.kurt@epa.gov>
Date: August 10, 2018 at 7:43:13 AM CDT
To: "Kelley, Jeff" <kelley.jeff@epa.gov>

Cc: "Nam, Ed" <nam.ed@epa.gov>
Subject: RE: Draft Sterigenics news release

Deliberative Process / Ex. 5

Kurt

From: Kelley, Jeff
Sent: Thursday, August 9, 2018 9:57 PM
To: Thiede, Kurt <thiede.kurt@epa.gov>
Cc: Nam, Ed <nam.ed@epa.gov>
Subject: Draft Sterigenics news release

Deliberative Process / Ex. 5

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

Message

From: Nwia, Jacqueline [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D299B56BD7EF46709FB7465FD1E15466-JNWIA]
Sent: 8/6/2018 11:55:03 AM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Nguyen, Phuong [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f07188263d014e06a28762ccf129ce20-PNguyen]
CC: McEvoy, Chad [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=47e7e24a4df14138917bbee65d8e8a08-CMcEvoy]; Compher, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e258cb856e3d4ae6bacca7fa48ca827a-MCompher]
Subject: RE: Technical Conference

Deliberative Process / Ex. 5

Jacqueline Nwia
Environmental Scientist
Air Monitoring and Analysis Section
Air Toxics and Assessment Branch
Air and Radiation Division
U.S. Environmental Protection Agency, Region 5
77 West Jackson Blvd. (AR-18)
Chicago, IL 60604
ph. (312) 886-6081
nwia.jacqueline@epa.gov

From: Cain, Alexis
Sent: Friday, August 3, 2018 4:47 PM
To: Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nguyen, Phuong <Nguyen.Phuong@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>
Subject: RE: Technical Conference

Deliberative Process / Ex. 5

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Nam, Ed
Sent: Friday, August 03, 2018 4:36 PM
To: Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nguyen, Phuong <Nguyen.Phuong@epa.gov>; Nwia, Jacqueline

<nwia.jacqueline@epa.gov>
Subject: RE: Technical Conference

Deliberative Process / Ex. 5

-Ed

From: Cain, Alexis
Sent: Friday, August 03, 2018 10:49 AM
To: Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nguyen, Phuong <Nguyen.Phuong@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>; Jeffrey Sprague <Jeff.Sprague@Illinois.gov>; King, Steven <Steven.King@Illinois.gov>; Mattison, Kevin <Kevin.Mattison@Illinois.gov>; Shappley, Ned <Shappley.Ned@epa.gov>; Witt, Jon <Witt.Jon@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>; Marcus, Danny <marcus.danny@epa.gov>; Ogulei, David <Ogulei.David@epa.gov>; Armitage, Julie <Julie.Armitage@Illinois.gov>
Subject: FW: Technical Conference

Sterigenics' questions to EPA about our monitoring. Questions mostly answered already, but which they have some follow-up questions on.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Hoffman, Kathy [mailto:KHoffman@sterigenics.com]
Sent: Tuesday, June 26, 2018 2:50 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Subject: RE: Technical Conference

Alexis:

Attached are some questions I received from Ramboll, our third-party consultant, that is assisting us in the review of your modelling and sampling data:

1. Please provide a description of the sampling methods used including:
    a. Types of collection devices
    b. Method of calibration
    c. QC samples included
    d. Verification or certification steps that equipment had been purged and cleaned
    e. Materials used in sampling train
    f. Any SOPs or other descriptions of the field methods employed
    g. Chain of custody procedures employed
    h. Sample security/integrity controls for samples collected over extended periods
    i. Traffic counts during sampling periods for locations near high-use roads, particularly differences between vehicle usage between day and night sampling periods for locations samples for extended periods.

2. Please describe the study design and sampling station location selection criteria with inclusion/exclusion factors.

3. Please provide information from background monitoring stations including locations and proximity to roadways, railways and industrial combustion sources.

4. Please provide monitoring results from background locations included in the study design or results from ambient air monitoring stations in the general area used to establish background conditions.

5. Please identify the laboratory and specific analytical methods employed for analyses including:
    a. Method number or citation and description of custom method if used
    b. Method detection limits
    c. Limits of quantification
    d. Results for laboratory and field QC samples
    e. Any modifications or deviations from SOPs or established methods.

6. Please provide meteorological information for each date and time of sampling including:
    a. Wind speed and direction for the general area at 10 m above ground level and any available upper level wind information
    b. Wind speed and direction near ground level (breathing zone) at each sampling station
    c. Relative humidity
    d. Temperature
    e. Amount and type of precipitation during sample collection.

7. Please provide meteorological information used as input for the modeling.

8. Please provide plot files or similar graphical output from the modeling showing concentration gradients, isopleths, or similar information.

We look forward to our discussion tomorrow.

Regards,
Kathy

From: Cain, Alexis [mailto:cain.alexis@epa.gov]
Sent: Monday, June 25, 2018 11:11 AM
To: Hoffman, Kathy
Subject: RE: Technical Conference

Hi Kathy—I hope you had a good weekend. We'd like to schedule the conference call for 11-12:30 on Wednesday. I'll send an appointment with conference call information. Please let me know who you will be including from Sterigenics, and in particular whether you will include counsel. You are welcome to do so of course; I will not invite our counsel unless yours will be participating.

Here's a draft agenda for the meeting; I welcome your input. If you have questions that you'd like us to answer on the call, it would be great if you could provide them in advance. We'll try to provide some specific questions for you tomorrow.

-Introductions
-Questions from Sterigenics for EPA about modeling and monitoring, if any
-Timeline for construction project
-Estimated emissions after construction project
-Potential future monitoring/stack rests
-EPA questions for Sterigenics (modeling parameters-- description and location of emissions points, exit velocities and potential fugitive emissions sources-- we will try to get you some questions tomorrow)
-Future meetings

Thanks!

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Hoffman, Kathy [mailto:KHoffman@sterigenics.com]
Sent: Friday, June 22, 2018 4:58 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Subject: Technical Conference

Per our discussion this afternoon, following are some time periods next Wednesday and Thursday for an hour call to discuss technical details of this project:

- Wednesday: Anytime from 11am to 2pm
- Thursday: Anytime from 11 to 2:30pm

I am also working with Ramboll to review your EO monitoring and modelling studies. They may have some technical questions on these studies. I have suggested that they provide me a list of any questions and that I can bring this list to our technical conference call too.

Regards,
Kathy

Kathleen Hoffman
Senior Vice President - Global Environmental, Health & Safety and Technical Services
Sterigenics, A Sotera Health Company
2015 Spring Road, Suite 650
Oak Brook, IL 60523
Office: 630.928.1758
khoffman@sterigenics.com

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This e-mail and any files transmitted with it may contain privileged and/or confidential information. If you believe this e-mail or any of its attachments were not intended for you, you must not use, distribute, forward, print or copy this e-mail or any attached files. If you have received this e-mail in error, please notify the sender by reply e-mail and then immediately delete the email and all attachments.

Message

From: Kelley, Jeff [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E154FA5A5F744C70AA3DA58E3F87AABE-JKELLEY]
Sent: 8/10/2018 4:31:04 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Rountree, Jillian [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7d304e5e55a54908b24b17e57ecdbf3c-JRountre]; Singer, Joshua [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f29c3a13f65447ae887edd3bdc89d77a-JSinge02]; Furey, Eileen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5aaa3a0ee58047d983897c53c1eb283e-EFurey]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]
Subject: RE: DRAFT Sterigenics News Release
Attachments: 20180809-sterigenic_news_release-v2.docx

Here's a clean version … at least for now, **Deliberative Process / Ex. 5 & Attorney Client / Ex. 5**

- **Deliberative Process / Ex. 5 & Attorney Client / Ex. 5**
-
-

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

From: Kelley, Jeff
Sent: Friday, August 10, 2018 11:14 AM
To: Cain, Alexis <cain.alexis@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Singer, Joshua <Singer.Joshua@epa.gov>
Cc: Furey, Eileen <furey.eileen@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Subject: RE: DRAFT Sterigenics News Release

Let me take the pen here to try to synthesize comments and send around a clean version.

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

From: Cain, Alexis
Sent: Friday, August 10, 2018 11:08 AM
To: Rountree, Jillian <Rountree.Jillian@epa.gov>; Singer, Joshua <Singer.Joshua@epa.gov>
Cc: Furey, Eileen <furey.eileen@epa.gov>; Kelley, Jeff <kelley.jeff@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Subject: RE: DRAFT Sterigenics News Release

Some comments on the comments.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Rountree, Jillian
Sent: Friday, August 10, 2018 10:07 AM
To: Singer, Joshua <Singer.Joshua@epa.gov>
Cc: Furey, Eileen <furey.eileen@epa.gov>; Kelley, Jeff <kelley.jeff@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Subject: RE: DRAFT Sterigenics News Release

Hello,

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Jill

ATTORNEY CLIENT PRIVILEGED; DELIBERATIVE

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5
77 W. Jackson Blvd. (C-14J), Cube 18010
Chicago, Illinois 60604
312-353-3849
rountree.jillian@epa.gov

Some of my email messages and attachments contain information that is privileged, confidential, or prohibited from disclosure under applicable law. If you believe you may have received this message in error, please inform the sender immediately. Further, do not read, print, or distribute any messages or attachments received in error. Immediately delete and otherwise destroy any such messages and attachments. Thank you.

From: Nam, Ed
Sent: Friday, August 10, 2018 8:08 AM
To: Singer, Joshua <Singer.Joshua@epa.gov>
Cc: Furey, Eileen <furey.eileen@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Kelley, Jeff <kelley.jeff@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Sieffert, Margaret

<Sieffert.Margaret@epa.gov>
Subject: Re: DRAFT Sterigenics News Release

There is a newer version with Cathy and Kuts additions. We will send around soon after cleaning it up a bit
Ed

Sent from my iPhone

On Aug 9, 2018, at 5:08 PM, Singer, Joshua <Singer.Joshua@epa.gov> wrote:

> Ed and Eileen and Jill,
>
> Please review the draft press release attached and below. Please let me know if this looks OK or if any changes are needed. Thank you.
>
> Josh Singer
> U.S. EPA, Region 5
> phone: 312-353-5069
> singer.joshua@epa.gov
>
> <image001.jpg>

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

<DRAFT Sterigenics EtO Press Release Revised August 9.docx>

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 7/6/2018 3:26:51 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Sterigenics - Met data & Plot files

We should ask them what safety equipment does everyone need to tour the facility? Safety goggle, hard hat, steel toe boots, etc..

From: Hoffman, Kathy [mailto:KHoffman@sterigenics.com]
Sent: Friday, July 06, 2018 10:22 AM
To: Cain, Alexis <cain.alexis@epa.gov>
Cc: Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Julie.Armitage@illinois.gov; Jeffrey Sprague <Jeff.Sprague@Illinois.gov>; King, Steven <Steven.King@Illinois.gov>; Mattison, Kevin <Kevin.Mattison@Illinois.gov>
Subject: RE: Sterigenics - Met data & Plot files

Alexis:

July 18th still works for us and the Willowbrook facility. Let me know what timing works for you. I will prepare some slides with detailed process description and emission information. We can go through this before we tour the facility. I am looking forward to meeting everyone and further these discussions.

Regards,
Kathy

From: Cain, Alexis [mailto:cain.alexis@epa.gov]
Sent: Thursday, July 05, 2018 10:39 AM
To: Hoffman, Kathy
Cc: Nam, Ed; Siegel, Kathryn; Sieffert, Margaret; Julie.Armitage@illinois.gov; Jeffrey Sprague
Subject: RE: Sterigenics - Met data & Plot files

Hi Kathy—I hope you had great Independence Day holiday!

July 18 works best for us for a visit to Willowbrook. If that still works for you, please let us know the best time for us to arrive.

Thanks!

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Hoffman, Kathy [mailto:KHoffman@sterigenics.com]
Sent: Friday, June 29, 2018 4:25 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Subject: RE: Sterigenics - Met data & Plot files

Alexis:

Thank you very much for this data. I have forwarded it to our Ramboll consultants for further review. I have been conducting a training seminar this week and this is my first day in the office catching up on emails.

As for dates of where you might come out to Willowbrook, I am on vacation next week and in Cleveland most of the following week for corporate meetings. Could we schedule something the week of July 16th or 23rd? The facility is available these weeks except they have all-day customer audits on Thursday, July 19th and Wednesday, July 25th. I would like to prepare a more detailed description of our operations and emissions and then tour the facility. If needed, I could have someone from Engineering present and they can show the status of the backvent project too. We should be quite a bit into the project by then.

As mentioned, I am out of the office next week but will be checking emails.

Regards,
Kathy

From: Cain, Alexis [mailto:cain.alexis@epa.gov]
Sent: Wednesday, June 27, 2018 4:13 PM
To: Hoffman, Kathy
Subject: Sterigenics - Met data & Plot files

Hello Kathleen—we're very pleased to be working cooperatively with you to address ethylene oxide issues; thank you for that.

I've attached a file with the five-year meteorological data used for the modeling, the plot files for the period (five-year) average, 1-hr average, and 8- hr average, as well as the met data collected during our three-day sampling period.

Could you suggest some days when we might come out to Willowbrook for a presentation and tour? It would be great to connect voices to faces, as well as to see your operations.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov
This e-mail and any files transmitted with it may contain privileged and/or confidential information. If you believe this e-mail or any of its attachments were not intended for you, you must not use, distribute, forward, print or copy this e-mail or any attached files. If you have received this e-mail in error, please notify the sender by reply e-mail and then immediately delete the email and all attachments.
This e-mail and any files transmitted with it may contain privileged and/or confidential information. If you believe this e-mail or any of its attachments were not intended for you, you must not use, distribute, forward, print or copy this e-mail or any attached files. If you have received this e-mail in error, please notify the sender by reply e-mail and then immediately delete the email and all attachments.

Message

From: Rountree, Jillian [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7D304E5E55A54908B24B17E57ECDBF3C-JROUNTRE]
Sent: 8/10/2018 3:06:37 PM
To: Singer, Joshua [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f29c3a13f65447ae887edd3bdc89d77a-JSinge02]
CC: Furey, Eileen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5aaa3a0ee58047d983897c53c1eb283e-EFurey]; Kelley, Jeff [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e154fa5a5f744c70aa3da58e3f87aabe-JKelley]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]
Subject: RE: DRAFT Sterigenics News Release
Attachments: 20180809-sterigenic_news_release-jk_kt_jrr.docx

Hello,

Attorney Client / Ex. 5 & Deliberative Process / Ex. 5

Jill

ATTORNEY CLIENT PRIVILEGED; DELIBERATIVE

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5
77 W. Jackson Blvd. (C-14J), Cube 18010
Chicago, Illinois 60604
312-353-3849
rountree.jillian@epa.gov

Some of my email messages and attachments contain information that is privileged, confidential, or prohibited from disclosure under applicable law. If you believe you may have received this message in error, please inform the sender immediately. Further, do not read, print, or distribute any messages or attachments received in error. Immediately delete and otherwise destroy any such messages and attachments. Thank you.

From: Nam, Ed
Sent: Friday, August 10, 2018 8:08 AM
To: Singer, Joshua <Singer.Joshua@epa.gov>
Cc: Furey, Eileen <furey.eileen@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Kelley, Jeff <kelley.jeff@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: Re: DRAFT Sterigenics News Release

There is a newer version with Cathy and Kuts additions. We will send around soon after cleaning it up a bit
Ed

Sent from my iPhone

On Aug 9, 2018, at 5:08 PM, Singer, Joshua <Singer.Joshua@epa.gov> wrote:

> Ed and Eileen and Jill,
>
> Please review the draft press release attached and below. Please let me know if this looks OK or if any changes are needed. Thank you.
>
> Josh Singer
> U.S. EPA, Region 5
> phone: 312-353-5069
> singer.joshua@epa.gov
>
> <image001.jpg>

Attorney Client / Ex. 5 & Deliberative Process / Ex. 5

<DRAFT Sterigenics EtO Press Release Revised August 9.docx>

Message

From: Siegel, Kathryn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F57A52EFEAD9497CB582B11B8C85F09F-KSIEGE02]
Sent: 7/3/2018 9:51:42 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: FW: EtO sources in Region 5
Attachments: timeline.docx

Alexis, per Ed's note, if the Sterigenics tour gets scheduled while I'm out, please ask Loretta to set up a meeting with Cathy two days (or shortly) after.

If you hear back from IEPA, it sounds like Ed wants to set up a separate meeting to discuss Ele and Medline (and potentially the MO source). Please ask for their availability for that too.

Thanks and have a great holiday!

From: Nam, Ed
Sent: Tuesday, July 03, 2018 3:53 PM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>
Cc: Cain, Alexis <cain.alexis@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>
Subject: RE: EtO sources in Region 5

Thanks.

I need to do some homework on this and look at the previous NATA.

In the meantime, please schedule the briefing for Cathy 2 days after our Sterigenics meeting. WE will cover this material as well as an update on the meeting and on the HQ plan for release (as far as we know it). We should also schedule a separate meeting with IEPA to discuss the other facility.

Ps. I made some updates to the talking points FAQ document today on sharepoint.

Pps: Attached is the latest timeline that I've been keeping up.

Ppps: I still haven't heard from Julie on the signature on the confidentiality agreement.

Thanks and have a great Fourth!
-Ed

From: Siegel, Kathryn
Sent: Tuesday, July 03, 2018 11:46 AM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Cain, Alexis <cain.alexis@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>
Subject: EtO sources in Region 5

Hi Ed,

Please find background materials about EtO sources in Region 5 attached. Thanks!

Katie Siegel, Chief
Air Toxics and Assessment Branch
Air and Radiation Division
U.S. EPA Region 5
siegel.kathryn@epa.gov
(312) 886-3006

Message

From: Nam, Ed [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A2653F1DDD59470688BA557DD84D9690-NAM, ED]
Sent: 8/10/2018 1:08:26 PM
To: Singer, Joshua [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f29c3a13f65447ae887edd3bdc89d77a-JSinge02]
CC: Furey, Eileen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5aaa3a0ee58047d983897c53c1eb283e-EFurey]; Rountree, Jillian [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7d304e5e55a54908b24b17e57ecdbf3c-JRountre]; Kelley, Jeff [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e154fa5a5f744c70aa3da58e3f87aabe-JKelley]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]
Subject: Re: DRAFT Sterigenics News Release

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Ed

Sent from my iPhone

On Aug 9, 2018, at 5:08 PM, Singer, Joshua <Singer.Joshua@epa.gov> wrote:

> Ed and Eileen and Jill,
>
> Please review the draft press release attached and below. Please let me know if this looks OK or if any changes are needed. Thank you.
>
> Josh Singer
> U.S. EPA, Region 5
> phone: 312-353-5069
> singer.joshua@epa.gov
>
> <image001.jpg>

Attorney Client / Ex. 5 & Deliberative Process / Ex. 5

Attorney Client / Ex. 5 & Deliberative Process / Ex. 5

<DRAFT Sterigenics EtO Press Release Revised August 9.docx>

Message

From: Siegel, Kathryn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F57A52EFEAD9497CB582B11B8C85F09F-KSIEGE02]
Sent: 8/9/2018 10:03:29 PM
To: Singer, Joshua [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f29c3a13f65447ae887edd3bdc89d77a-JSinge02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]
Subject: RE: DRAFT Sterigenics News Release

Please send to Ed, Eileen and Jill Rountree of ORC. Thanks, Josh!

From: Singer, Joshua
Sent: Thursday, August 09, 2018 5:01 PM
To: Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: DRAFT Sterigenics News Release

These changes look good to me. Is there an attorney assigned to this issue that we can loop in, or should I just send this Ed and Eileen for final ARD approval? Thanks again.

Josh Singer
U.S. EPA, Region 5
phone: 312-353-5069
singer.joshua@epa.gov

From: Cain, Alexis
Sent: Thursday, August 09, 2018 4:07 PM
To: Singer, Joshua <Singer.Joshua@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Cc: Kelley, Jeff <kelley.jeff@epa.gov>
Subject: RE: DRAFT Sterigenics News Release

Thanks Josh. Just a few edits from Katie and me, attached.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Singer, Joshua
Sent: Thursday, August 09, 2018 3:45 PM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Cc: Kelley, Jeff <kelley.jeff@epa.gov>
Subject: DRAFT Sterigenics News Release

Katie, Alexis and Margaret,

Please see the draft news release attached and below.

Please edit or let me know if this looks OK. Feel free to call me if that's easier. Thank you.

Josh Singer
U.S. EPA, Region 5
phone: 312-353-5069
singer.joshua@epa.gov

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 7/26/2018 1:00:28 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
CC: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
Subject: RE: Scheduling a Sterigenics update with Cathy Stepp

I think 10 or 10:30 (if only ½ hour is needed) is fine. I have an regional emissions call on my calendar at 10 but most of time that call gets cancelled and just an email with updates is sent. Notes are also sent after call.

-Margaret

From: Cain, Alexis
Sent: Thursday, July 26, 2018 7:46 AM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: FW: Scheduling a Sterigenics update with Cathy Stepp

Preferences for 8/2? We have a section meeting 9-10 and a state call 1-2:30, so that leaves 10, 10:30, and 2:30.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Shaffer, Loretta
Sent: Wednesday, July 25, 2018 4:01 PM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Subject: FW: Scheduling a Sterigenics update with Cathy Stepp

The next available for the RA is Aug 2, is this okay? Ed's available on the 2nd from 9-11am and 2-3

From: Williams, Felicia
Sent: Wednesday, July 25, 2018 3:32 PM
To: Shaffer, Loretta <Shaffer.Loretta@epa.gov>; Martinez, Isidra <Martinez.Isidra@epa.gov>
Subject: RE: Scheduling a Sterigenics update with Cathy Stepp

Hi Loretta - the next available time for Cathy is August 2 – let me know if this will work for Ed.

Thanks!
Felicia

From: Shaffer, Loretta
Sent: Wednesday, July 25, 2018 3:12 PM
To: Williams, Felicia <Williams.Felicia@epa.gov>; Martinez, Isidra <Martinez.Isidra@epa.gov>
Subject: Scheduling a Sterigenics update with Cathy Stepp

Hi Felicia/Isidra,

Ed would like to setup a 30 minute meeting to update the RA on (Sterigenics). Best time would be next Monday, 7/30 or Tuesday, 7/31. thanks

Title: Sterigenics Update
Duration: 30 minutes
Location: RA's Conference Room
Participants: Ed Nam, Kathryn Siegel, Alexis Cain, Margaret Sieffert, Mark Johnson of ATSDR, Loretta Shaffer and (Eileen Furey, as optional)

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, DIRECTOR

217/785-1705

CONSTRUCTION PERMIT
NESHAP SOURCE

PERMITTEE

Sterigenics US, LLC
Attn: Laura Hartman, EHS Manager
2015 Spring Road, Suite 650
Oak Brook, Illinois 60523

Application No.: 18060020 I.D. No.: 043110AAC
Applicant's Designation: Date Received: June 11, 2018
Subject: Control of the Backvents of the Sterilization Chambers
Date Issued: June 26, 2018
Location: 7775 Quincy and 830 Midway, Willowbrook, DuPage County

This Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of control of the backvents of the sterilization chambers, as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1. Introduction

a. This permit authorizes control of the existing backvents of the five sterilization chambers (SC-1, SC-2, SC-3, SC-4 and SC-5) at Sterigenic's Willowbrook facilities using the existing control systems that control emissions of ethylene oxide from the vacuum pumps and from aeration.

b. This permit does not authorize changes to the sterilization chambers or other emission units at the source that would increase their capacity or emissions.

c. For purposes of this permit, the existing sterilization chambers after their backvents are also connected to control systems are referred to as the "affected units."

2. Existing Requirements

This permit does alter established requirements for the affected units, (i.e., applicable emission standards and requirements for testing, monitoring, recordkeeping and reporting), as identified in Sections 4.1 and 4.2 of the Clean Air Act Permit Program (CAAPP) permit for the source, Permit No. 95120085, issued June 8, 2015. In particular, the affected units will continue to be subject to federal National Emission Standards for Hazardous Air Pollutants (NESHAP) for Ethylene Oxide Emissions from Sterilization Facilities, 40 CFR 63 Subpart O.

3. Non-applicability Provisions

This permit is issued based on this project not constituting a major modification for purposes of the state rules for Major Stationary Sources Construction and Modification (MSSCAM), 35 IAC Part 203. This is because this project is an emission reduction project that will reduce emissions of volatile organic material.

4. Good Air Pollution Control Practices

At all times, the Permittee shall maintain and operate the affected units and associated air pollution control systems in a manner consistent with good air pollution control practices for minimizing emissions.

5. Notification

The Permittee shall notify the Illinois EPA within 30 days after completion of this project. This notification shall include the date that the backvent on each affected unit is first controlled.

6. Testing

a. Within 180 days of completion of this project, for the affected units, the Permittee shall perform performance testing in accordance with 40 CFR 63.365 and 63.7. The Permittee shall submit applicable notifications and reports for this testing as required by 40 CFR 63.7, 63.360, 63.365 and 63.366.

b. The following USEPA methods and procedures shall be used for testing, unless another USEPA method is approved by the Illinois EPA:

Flowrate	Method 2, 2A, 2B, 2C or 2D
Oxygen (O_2)/Carbon Dioxide (CO_2)	Method 3A or 3B
Moisture	Method 4 or 320
Ethylene Oxide/Propylene Oxide	Method 18 or 320

c. The Permittee shall submit a written test plan to the Illinois EPA for this testing and if a significant change in the procedures for this testing is planned from the procedures followed in the previous test. This plan shall be submitted at least 30 days prior to the actual date of testing and include the following information as a minimum:

i. A description of the planned test procedures.

ii. The person(s) who will be performing sampling and analysis and their experience with similar tests.

iii. The specific conditions under which testing will be performed, including a discussion of why these conditions will be representative of maximum emissions and the means or manner by which the operating parameters for the emission unit and any control equipment will be determined.

iv. The specific determinations of emissions and operation that are intended to be made, including sampling and monitoring locations.

v. The test method(s) that will be used, with the specific analysis method, if the method can be used with different analysis methods.

d. The Permittee shall notify the Illinois EPA prior to conducting these measurements to enable the Illinois EPA to observe testing. Notification for the expected date of testing shall be submitted a minimum of 30 days prior to the expected date. Notification of the actual date and expected time of testing shall be submitted a minimum of 5 working days prior to the actual date of the test. The Illinois EPA may accept shorter advance notice if it does not interfere with the Illinois EPA's ability to observe testing.

e. Copies of the Final Report(s) for these tests shall be submitted to the Illinois EPA within 30 days after the test results are compiled and finalized but no later than 60 days after completion of sampling. The Final Report shall include as a minimum:

i. General information, i.e., date of test, names of testing personnel, and names of Illinois EPA observers.

ii. A summary of results, e.g., VOM emissions, pounds.

iii. A detailed description of operating conditions of the emission unit(s) during testing, including:

A. Process information, i.e., mode(s) of operation, process rate, e.g. fuel or raw material consumption.

B. Control equipment information, i.e., equipment condition and operating parameters during testing.

C. A discussion of any preparatory actions taken, i.e., inspections, maintenance and repair.

iv. Description of test method(s), including description of sampling points, sampling train, analysis equipment, and test schedule.

v. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration.

vi. Conclusions.

f. The Permittee shall retain copies of emission test reports for at least three years beyond the date that an emission test is superseded by a more recent test.

7. <u>Authorization to Operate</u>

The Permittee may operate the affected units with backvents ducted to the existing control systems pursuant to this construction permit until the CAAPP permit for the source is revised to address this project. This condition supersedes Standard Condition 6.

Please note that the Illinois EPA has not acted in this permit on Sterigenic's request for enforceable limits on the operation and emissions of its Willowbrook facilities so that this source is not a major source under relevant air pollution control regulations. The Illinois EPA is processing that request as a separate application.

If you have any questions on this permit, please contact Daniel Rowell at 217/558-4368.

Raymond E. Pilapil
Manager, Permit Section
Bureau of Air

REP:DBR:jlp

DBR
6/26/18

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL
P. O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

STANDARD CONDITIONS FOR CONSTRUCTION/DEVELOPMENT PERMITS ISSUED BY THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

July 1, 1985

The Illinois Environmental Protection Act (Illinois Revised Statutes, Chapter 111-1/2, Section 1039) authorizes the Environmental Protection Agency to impose conditions on permits which it issues.

The following conditions are applicable unless superseded by special condition(s).

1. Unless this permit has been extended or it has been voided by a newly issued permit, this permit will expire one year from the date of issuance, unless a continuous program of construction or development on this project has started by such time.

2. The construction or development covered by this permit shall be done in compliance with applicable provisions of the Illinois Environmental Protection Act, and Regulations adopted by the Illinois Pollution Control Board.

3. There shall be no deviations from the approved plans and specifications unless a written request for modification, along with plans and specifications as required, shall have been submitted to the Agency and a supplemental written permit issued.

4. The Permittee shall allow any duly authorized agent of the Agency upon the presentation of credentials, at reasonable times:

   a. to enter the Permittee's property where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit,

   b. to have access to and copy any records required to be kept under the terms and conditions of this permit,

   c. to inspect, including during any hours of operation of equipment constructed or operated under this permit, such equipment and any equipment required to be kept, used, operated, calibrated and maintained under this permit,

   d. to obtain and remove samples of any discharge or emission of pollutants, and

   e. to enter and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring, or recording any activity, discharge, or emission authorized by this permit.

5. The issuance of this permit:

   a. shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are to be located,

   b. does not release the Permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the proposed facilities,

   c. does not release the Permittee from compliance with the other applicable statues and regulations of the United States, of the State of Illinois, or with applicable local laws, ordinances and regulations,

   d. does not take into consideration or attest to the structural stability of any units or parts of the project, and

e. in no manner implies or suggests that the Agency (or its officers, agents or employees) assumes any liability, directly or indirectly, for any loss due to damage, installation, maintenance, or operation of the proposed equipment or facility.

6. a. Unless a joint construction/operation permit has been issued, a permit for operation shall be obtained from the Agency before the equipment covered by this permit is placed into operation.

   b. For purposes of shakedown and testing, unless otherwise specified by a special permit condition, the equipment covered under this permit may be operated for a period not to exceed thirty (30) days.

7. The Agency may file a complaint with the Board for modification, suspension or revocation of a permit:

   a. upon discovery that the permit application contained misrepresentations, misinformation or false statements or that all relevant facts were not disclosed, or

   b. upon finding that any standard or special conditions have been violated, or

   c. upon any violations of the Environmental Protection Act or any regulation effective thereunder as a result of the construction or development authorized by this permit.

Message

From: Shaffer, Loretta [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8B2C6BBD3D1E407AAC279D330822AEFD-LSHAFFER]
Sent: 7/25/2018 10:02:39 PM
To: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Scheduling a Sterigenics update with Cathy Stepp

I'll let Felicia know.

From: Siegel, Kathryn
Sent: Wednesday, July 25, 2018 4:56 PM
To: Shaffer, Loretta <Shaffer.Loretta@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Subject: RE: Scheduling a Sterigenics update with Cathy Stepp

Let's take it for now, but I have a feeling that once Ed sends them the ATSDR letter, they would like to meet sooner. Thank you, Loretta!

From: Shaffer, Loretta
Sent: Wednesday, July 25, 2018 4:01 PM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Subject: FW: Scheduling a Sterigenics update with Cathy Stepp

The next available for the RA is Aug 2, is this okay? Ed's available on the 2nd from 9-11am and 2-3

From: Williams, Felicia
Sent: Wednesday, July 25, 2018 3:32 PM
To: Shaffer, Loretta <Shaffer.Loretta@epa.gov>; Martinez, Isidra <Martinez.Isidra@epa.gov>
Subject: RE: Scheduling a Sterigenics update with Cathy Stepp

Hi Loretta - the next available time for Cathy is August 2 – let me know if this will work for Ed.

Thanks!
Felicia

From: Shaffer, Loretta
Sent: Wednesday, July 25, 2018 3:12 PM
To: Williams, Felicia <Williams.Felicia@epa.gov>; Martinez, Isidra <Martinez.Isidra@epa.gov>
Subject: Scheduling a Sterigenics update with Cathy Stepp

Hi Felicia/Isidra,

Ed would like to setup a 30 minute meeting to update the RA on (Sterigenics). Best time would be next Monday, 7/30 or Tuesday, 7/31. thanks

Title: Sterigenics Update
Duration: 30 minutes
Location: RA's Conference Room

Participants: Ed Nam, Kathryn Siegel, Alexis Cain, Margaret Sieffert, Mark Johnson of ATSDR, Loretta Shaffer and (Eileen Furey, as optional)

Message

From: Colledge, Michelle [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=20FA592058B44FA4B2FC724A8DB2241B-MCOLLEDG]
Sent: 7/25/2018 8:51:28 PM
To: Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]
CC: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]
Subject: Re: When is your meeting tomorrow?

Thanks a bunch Margaret!!!

> On Jul 25, 2018, at 3:47 PM, Sieffert, Margaret <Sieffert.Margaret@epa.gov> wrote:
>
> Here are ARD's comments (mostly mine and George's). Enjoy your leave.
>
> -Margaret
>
> -----Original Message-----
> From: Colledge, Michelle
> Sent: Wednesday, July 25, 2018 3:42 PM
> To: Siegel, Kathryn <siegel.kathryn@epa.gov>
> Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>
> Subject: Re: When is your meeting tomorrow?
>
> Awesome! And thanks ☺
>
> Sent from my iPhone
>
>> On Jul 25, 2018, at 3:41 PM, Siegel, Kathryn <siegel.kathryn@epa.gov> wrote:
>>
>> Hi Michelle,
>>
>> Ed's meeting is at noon, so the morning will be perfect.
>>
>> Margaret will send over our comments any minute.
>>
>> Thank you again and have a wonderful vacation!
>>
>>
>> Katie Siegel, Chief
>> Air Toxics and Assessment Branch
>> Air and Radiation Division
>> U.S. EPA Region 5
>> siegel.kathryn@epa.gov
>> (312) 886-3006
>>
>> -----Original Message-----
>> From: Colledge, Michelle
>> Sent: Wednesday, July 25, 2018 3:36 PM
>> To: Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
>> Subject: When is your meeting tomorrow?
>>
>> Mark will send the letter. He wants to know if morning is too late to send the letter since I had to leave without giving him the clean draft.
>>
>> Sent from my iPhone
> <ATSDR Sterigenics EtO Consult Letter v.7.25.18 ARD comments.docx>

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 7/25/2018 8:47:35 PM
To: Colledge, Michelle [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=20fa592058b44fa4b2fc724a8db2241b-MColledg]
CC: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]
Subject: RE: When is your meeting tomorrow?
Attachments: ATSDR Sterigenics EtO Consult Letter v.7.25.18 ARD comments.docx

Here are ARD's comments (mostly mine and George's). Enjoy your leave.

-Margaret

-----Original Message-----
From: Colledge, Michelle
Sent: Wednesday, July 25, 2018 3:42 PM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: Re: When is your meeting tomorrow?

Awesome! And thanks ☺

Sent from my iPhone

> On Jul 25, 2018, at 3:41 PM, Siegel, Kathryn <siegel.kathryn@epa.gov> wrote:
>
> Hi Michelle,
>
> Ed's meeting is at noon, so the morning will be perfect.
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> Thank you again and have a wonderful vacation!
>
>
> Katie Siegel, Chief
> Air Toxics and Assessment Branch
> Air and Radiation Division
> U.S. EPA Region 5
> siegel.kathryn@epa.gov
> (312) 886-3006
>
> -----Original Message-----
> From: Colledge, Michelle
> Sent: Wednesday, July 25, 2018 3:36 PM
> To: Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
> Subject: When is your meeting tomorrow?
>
> Mark will send the letter. He wants to know if morning is too late to send the letter since I had to leave without giving him the clean draft.
>
> Sent from my iPhone

Message

From: Siegel, Kathryn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F57A52EFEAD9497CB582B11B8C85F09F-KSIEGE02]
Sent: 1/19/2018 9:48:32 PM
To: Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: EtO update

Looks great. Fixed one typo below. Sorry I didn't catch you before the end of the day, but it can wait until next week. Thank you!

From: Sieffert, Margaret
Sent: Friday, January 19, 2018 3:30 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: RE: EtO update

I will send the email on Monday morning unless you want it out today. Text me at Personal Phone / Ex. 6 on my cell phone and I can get back into email and send it today. If I don't hear from you have a good weekend.

Margaret

From: Sieffert, Margaret
Sent: Friday, January 19, 2018 2:24 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: RE: EtO update

I like your suggested revision. If Katie doesn't have anything else I can send the email today. I am off at 3:30 today.

-Margaret

From: Cain, Alexis
Sent: Friday, January 19, 2018 2:20 PM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: RE: EtO update

Thanks Margaret—here's a suggested revision. Deliberative Process / Ex. 5
Deliberative Process / Ex. 5

Kevin,

Deliberative Process / Ex. 5

Thanks,
Margaret

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Sieffert, Margaret
Sent: Friday, January 19, 2018 2:00 PM
To: Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: EtO update

After we spoke I left a message and an email for Charmagne but haven't heard back from her yet so no update with regard to permitting at this time.

Deliberative Process / Ex. 5

As for a follow-up letter, how about this:

Kevin,

Deliberative Process / Ex. 5

Thanks,
Margaret

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 7/25/2018 8:15:54 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
Subject: RE: DRAFT EtO Letter Health Consultation: Please review for technical accuracy
Attachments: ATSDR Sterigenics EtO Consult Letter v.7.25.18 ARD comments.docx

Here are my comments along with the one from George. You can add yours to this as well before we send to Michelle.

From: Colledge, Michelle
Sent: Wednesday, July 25, 2018 11:55 AM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Subject: DRAFT EtO Letter Health Consultation: Please review for technical accuracy
Importance: High

Hi Margaret-

Our LHC has cleared ATSDR-the day before I go on vacation! Yay for good timing!

Please review this draft for technical accuracy (pay special attention to sampling numbers, locations, and facility info). Please provide your revisions in track changes and get back to me as soon as possible. If it's by COB today, I will be able to get you a clean copy today, more than likely. If there is an enforcement lead/manager that should also see it, please share with whoever is appropriate.

Note that I will be out of the office starting tomorrow until August 13th.

Please call me if you have any questions.

Thx,
Michelle

Michelle A. Colledge MPH, PhD
CAPT, U.S. Public Health Service
Agency for Toxic Substances and Disease Registry/NCEH/CDC, Region 5
77 W. Jackson Blvd., Room 413
Mailstop ATSD-4J
Chicago, Illinois 60604
Tel: 312-886-1462
Fax: 312-886-6066

please consider the environment before printing this email

Message

From: Shaffer, Loretta [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8B2C6BBD3D1E407AAC279D330822AEFD-LSHAFFER]
Sent: 7/25/2018 8:13:11 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
CC: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
Subject: RE: Scheduling a Sterigenics update for RA

I sent the meeting request to Felicia and Isidra, waiting on a response.

From: Cain, Alexis
Sent: Wednesday, July 25, 2018 2:52 PM
To: Shaffer, Loretta <Shaffer.Loretta@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: Scheduling a Sterigenics update for RA

We'd like to schedule a quick update for the RA on Sterigenics, specifically since we expect to have a letter from ATSDR shortly.

Best time would be next Monday. Tuesday also possible. Should include, me, Margaret Sieffert, Katie, Ed, and Mark Johnson of ATSDR, cc to Eileen.

Thanks!

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

Message

From: Nam, Ed [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A2653F1DDD59470688BA557DD84D9690-NAM, ED]
Sent: 8/3/2018 9:40:19 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Sterigenics call follow-up

I didn't know who all was on the call. Please forward as appropriate.

Thanks
Ed

From: Cain, Alexis
Sent: Friday, August 03, 2018 4:21 PM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: Sterigenics call follow-up

Ed—here is a suggested follow-up email to send to Kathy H:

Deliberative Process / Ex. 5

Thanks again.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

Message

From: Furey, Eileen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=5AAA3A0EE58047D983897C53C1EB283E-EFUREY]
Sent: 7/2/2018 7:01:19 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Sterigenics - Met data & Plot files

He's an ARD summer extern. We don't have to send him if you feel uncomfortable.

Eileen L. Furey
Deputy Director
Air and Radiation Division
U.S. EPA Region 5
(312) 886-7950

From: Cain, Alexis
Sent: Monday, July 02, 2018 12:50 PM
To: Furey, Eileen <furey.eileen@epa.gov>
Subject: RE: Sterigenics - Met data & Plot files

Right, but isn't that his role?

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Furey, Eileen
Sent: Monday, July 02, 2018 11:23 AM
To: Cain, Alexis <cain.alexis@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Sterigenics - Met data & Plot files

He's not one yet!

Eileen L. Furey
Deputy Director
Air and Radiation Division
U.S. EPA Region 5
(312) 886-7950

From: Cain, Alexis
Sent: Monday, July 02, 2018 11:22 AM
To: Furey, Eileen <furey.eileen@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Sterigenics - Met data & Plot files

So far, these have been attorney-free meetings.

Alexis Cain

USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Furey, Eileen
Sent: Monday, July 02, 2018 11:21 AM
To: Cain, Alexis <cain.alexis@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Sterigenics - Met data & Plot files

If C.J. can go, I'd love him to be able to take the tour. I definitely do not need to go.

Eileen L. Furey
Deputy Director
Air and Radiation Division
U.S. EPA Region 5
(312) 886-7950

From: Cain, Alexis
Sent: Monday, July 02, 2018 9:33 AM
To: Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: FW: Sterigenics - Met data & Plot files

Sterigenics suggests the weeks of July 16 and 23 (excluding the 19th and 25th). I would like to exclude the 24th.

So . . . 7/16, 17, 18, 20, 23, 26, 27. Any preferences?

We probably should think also about who is essential. Do we want to take 12 people on a plant tour? I think Margaret is essential. I'd like to go, but I'm not essential. Danny? Jackie?

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Hoffman, Kathy [mailto:KHoffman@sterigenics.com]
Sent: Friday, June 29, 2018 4:25 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Subject: RE: Sterigenics - Met data & Plot files

Alexis:

Thank you very much for this data. I have forwarded it to our Ramboll consultants for further review. I have been conducting a training seminar this week and this is my first day in the office catching up on emails.

As for dates of where you might come out to Willowbrook, I am on vacation next week and in Cleveland most of the following week for corporate meetings. Could we schedule something the week of July 16th or 23rd? The facility is available these weeks except they have all-day customer audits on Thursday, July 19th and Wednesday, July 25th. I would like to prepare a more detailed description of our operations and emissions and then tour the facility. If needed, I could have someone from Engineering present and they can show the status of the backvent project too. We should be quite a bit into the project by then.

As mentioned, I am out of the office next week but will be checking emails.

Regards,
Kathy

From: Cain, Alexis [mailto:cain.alexis@epa.gov]
Sent: Wednesday, June 27, 2018 4:13 PM
To: Hoffman, Kathy
Subject: Sterigenics - Met data & Plot files

Hello Kathleen—we're very pleased to be working cooperatively with you to address ethylene oxide issues; thank you for that.

I've attached a file with the five-year meteorological data used for the modeling, the plot files for the period (five-year) average, 1-hr average, and 8- hr average, as well as the met data collected during our three-day sampling period.

Could you suggest some days when we might come out to Willowbrook for a presentation and tour? It would be great to connect voices to faces, as well as to see your operations.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov
This e-mail and any files transmitted with it may contain privileged and/or confidential information. If you believe this e-mail or any of its attachments were not intended for you, you must not use, distribute, forward, print or copy this e-mail or any attached files. If you have received this e-mail in error, please notify the sender by reply e-mail and then immediately delete the email and all attachments.

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 6/12/2018 8:37:38 PM
To: Nwia, Jacqueline [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d299b56bd7ef46709fb7465fd1e15466-JNwia]
CC: Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: 2018 June 20 RA EtO Briefing_JN Comments
Attachments: 2018 June 20 RA EtO Briefing v2.docx

Thanks Alexis and Jackie. I have combined your comments in v2. Once I have George's we can share with management.

Deliberative Process / Ex. 5 The document is called a letter consult according to similar documents Michelle shared with me. I do think we need to be prepared to answer the questions you brought up: I think the questions that will come up include:

What will be the goal/purpose of approaching the facility

What will the recommendation be to the village, health dept. community and EPA colleagues.

What will the parameters of the longer term monitoring be?

Thanks and talk to everyone tomorrow,
Margaret

From: Nwia, Jacqueline
Sent: Tuesday, June 12, 2018 3:11 PM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Cc: Bollweg, George <bollweg.george@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Subject: 2018 June 20 RA EtO Briefing_JN Comments

Suggestions.

Message

From: Nguyen, Phuong [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F07188263D014E06A28762CCF129CE20-PNGUYEN]
Sent: 6/22/2018 1:10:19 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Monitoring Results-Modeling files
Attachments: Sterigenics.inp; Sterigenics.out

Alexis- Here are the modeling input/output files for Sterigenics.

Phuong

From: Sieffert, Margaret
Sent: Friday, June 22, 2018 6:40 AM
To: Cain, Alexis <cain.alexis@epa.gov>; Nguyen, Phuong <Nguyen.Phuong@epa.gov>
Subject: RE: Monitoring Results

I forwarded you the email I believe she mentions which requests the modeling parameters but the modeling result was what was sent in the Dec 22 letter. We never got any response to those modeling parameters so we were unable to revise the modeling. There was also no communication requesting the modeling input and output files. Phuong will have to pull those together as I do not have those files.

Phuong can you pull the AERMOD files for Sterigenics and send them to Alexis? Not sure if he needs to get the OK to send those files so I would just send them to him and he can forward to Sterigenics with an email stating no response/confirmation was received nor did Sterigenics request the files.

-Margaret

From: Hoffman, Kathy [mailto:KHoffman@sterigenics.com]
Sent: Thursday, June 21, 2018 10:20 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Monitoring Results

Thank you for sharing these results with me.

As we discussed today, I reviewed our files on this matter. You indicated today that you had forwarded all of your modelling results earlier for us to review. From my limited review today, we did not receive the modelling results from your office. We received an email in late January to confirm some modelling input parameters but did not receive any modelling results to review and/or verify accuracy. Can you forward to complete modelling input and results for us to review? We would like to review this information carefully.

We can discuss further tomorrow as needed.

Regards,
Kathy

From: Cain, Alexis [mailto:cain.alexis@epa.gov]
Sent: Thursday, June 21, 2018 5:11 PM
To: Hoffman, Kathy
Cc: Sieffert, Margaret
Subject: Monitoring Results

Dear Kathy—here are the monitoring data results table and coordinating map. Please let us know if you have any questions.

Thanks,
Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

This e-mail and any files transmitted with it may contain privileged and/or confidential information. If you believe this e-mail or any of its attachments were not intended for you, you must not use, distribute, forward, print or copy this e-mail or any attached files. If you have received this e-mail in error, please notify the sender by reply e-mail and then immediately delete the email and all attachments.

Message

From: Nwia, Jacqueline [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D299B56BD7EF46709FB7465FD1E15466-JNWIA]
Sent: 6/12/2018 8:34:24 PM
To: Compher, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e258cb856e3d4ae6bacca7fa48ca827a-MCompher]
CC: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]
Subject: 2018June8-Sterigenics Report DRAFT060718 v1
Attachments: 2018June8-Sterigenics Report DRAFT060718 v1.docx

All,

Attached is the monitoring data report. Please let me know if you have any comments.

Jackie

Message

From: Marcus, Danny [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A34C75D25A6243E68733A8EE7E2DDF82-DMARCUS]
Sent: 7/2/2018 5:49:24 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Sterigenics tour

At this point, I'm going to be out that week. But that's ok, majority rules – if I can't make it, it won't be the end of the world..

From: Cain, Alexis
Sent: Monday, July 2, 2018 12:48 PM
To: Marcus, Danny <marcus.danny@epa.gov>
Subject: RE: Sterigenics tour

Thanks. Haven't nailed it down yet, but it seems like 7/18 might be a contender too. Any chance of making it 7/18?

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Marcus, Danny
Sent: Monday, July 02, 2018 11:52 AM
To: Cain, Alexis <cain.alexis@epa.gov>
Subject: RE: Sterigenics tour

The 26th works the best for me. Thanks for checking in, Alexis.

From: Cain, Alexis
Sent: Monday, July 2, 2018 10:56 AM
To: Marcus, Danny <marcus.danny@epa.gov>
Subject: Sterigenics tour

We're possibly looking at 7/18, 26 or 27 for our tour of Sterigenics. How are those days for you?

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

Sterigenics.

ETR
12-13-16
IDI

ST1
043110AAC

February 13, 2017

Illinois EPA, Bureau of Air
Compliance and Enforcement Section (MC 40)
1021 North Grand Avenue East
PO Box 19276
Springfield, Illinois 62794-9276

A
no review
send
KM
2-15-17

RECEIVED
STATE OF ILLINOIS
FEB 14 2017
ENVIRONMENTAL PROTECTION AGENCY
BUREAU OF AIR

RE: Notification of Compliance Status
Sterigenics' Willowbrook, IL Facility, I.D. No.: 043110AAC
Permit No.: 95120085

Dear Sir:

This Notification of Compliance Status is being sent pursuant to 40 CFR 63.9(h) for Sterigenics' Willowbrook, IL facility. The facility is subject to the NESHAP emission standards at 40 CFR 63.362. On December 12-13, 2016 annual performance testing of the facility's Deoxx Scrubber at Willowbrook I (WB1) facility and the AAT Scrubber/Drybed at Willowbrook II (WB2) was conducted per the work practices requirement stated at 40 CFR 63.363(b)(2)(ii).

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

FEB 28 2017

REVIEWER: RDH

Facility Name:
Sterigenics U.S., LLC - Willowbrook Facility
7775 Quincy Street
Willowbrook, IL 60527

Method(s) Used to Determine Compliance - *Section 63.9(h)(A)*
Performance testing of the Willowbrook I facility's Deoxx Scrubber system was conducted on December 12, 2016 in accordance with the test methods in 40 CFR 63.365 for Ethylene Oxide Sterilization Facilities. The WB I facility's AAT scrubber/drybed system previously was tested on January 23, 2003 following test methods stated in 40 CFR 63.365.

Performance testing of the Willowbrook II facility's AAT Scrubber/Drybed system was conducted on December 13, 2016 in accordance with the test methods in 40 CFR 63.365 for Ethylene Oxide Sterilization Facilities.

Performance Test Results - *Section 63.9(h)(B)*
The December 12th testing of the WB1 Deoxx Scrubber system demonstrated an average control efficiency of 99.9996 % for treating process emissions from the facility's sterilization chamber vacuum pumps. The testing demonstrates the facility conforms to the 99.0% minimum efficiency standard specified in 40 CFR 63.362(d) and the performance standard stated in the facility's air permit. The tested operating efficiency of the WB1 AAT Scrubber/Drybed system on January 23, 2003 was 99.9 %. This performance level conforms to the 99% minimum efficiency standard in 40 CFR 63.362(c) and the 99% or < 1 ppmv control requirement in the facility's air permit.

The December 13th testing of the WB2 AAT Scrubber/Drybed system demonstrated an average control efficiency of 99.94 % for treating process emissions from the facility's sterilization chamber vacuum pumps. The tested operating efficiency of the WB2 aeration emissions through the AAT Scrubber/Drybed system demonstrated an average control efficiency of 99.96% The testing demonstrates the facility conforms to the 99.0% minimum efficiency standard specified in 40 CFR 63.362(d) and the performance standard stated in the facility's air permit.

Sterigenics International, US, LLC.
2015 Spring Road, Suite 650 • Oakbrook, IL 60523
Tel 800.472.4508 • Fax 630.928.1701 • www.sterigenics.com

ED_002192_00004255-00001

Sterigenics.

Methods to be Used for Determining Continued Compliance *Section 63.9(h)(C)*
The facility assures continuing compliance with the Section 63.362 standards by measuring and recording the Deoxx and AAT scrubber systems liquor pH and tank level on a weekly basis. The AAT Drybed systems are also tested weekly to ensure outlet emissions are below 1ppmv.

Type and Quantity of Hazardous Air Pollutants Emitted During Reporting Period - *Section 63.9(h)(D)*
The Willowbrook I facility used approximately 264,951 pounds of ethylene oxide during the 12 month period ending December 31, 2016. Approximately 95% of that amount (251, 703 pounds) is emitted through sterilization chamber vents (via vacuum pumps) to the Deoxx wet scrubber system. Using the 99.9996% control efficiency obtained from the December 12th test, the resulting emissions are calculated to be approximately 1 pound per year. Approximately 4% of the ethylene oxide used by the facility (10,598 pounds) represents process emissions from the facility's aeration room which is treated by the AAT Scrubber/Drybed system. Using the 99.9% control efficiency demonstrated during the January 23, 2003 test, the resulting annual emissions from the aeration room total approximately 11 pounds. Backvent process emissions, representing approximately 1% of total ethylene oxide used (2,650 pounds) are not treated and exhaust to atmosphere resulting in 2,650 pounds. In total, the facility had an estimated 2,662 pounds (1.33 tons) of ethylene oxide point source emissions during the 12 month period ending December 31, 2016.

The Willowbrook II facility used approximately 127,543 pounds of ethylene oxide during the 12 month period ending December 31, 2016. Approximately 95% of that amount (121,166 pounds) is emitted through sterilization chamber vents (via vacuum pumps) to the AAT Scrubber/Drybed system. Using the 99.94% control efficiency obtained from the December 13th test, the resulting emissions are calculated to be approximately 73 pounds per year. Approximately 4% of the ethylene oxide used by the facility (5,102 pounds) represents process emissions from the facility's aeration room which is also treated by the AAT Scrubber/Drybed system. Using the 99.96% control efficiency demonstrated during the December 13th test, the resulting annual emissions from the aeration room total approximately 2 pounds. Backvent process emissions, representing approximately 1% of total ethylene oxide used (1,275 pounds) are not treated and exhaust to atmosphere resulting in 1,275 pounds. In total, the facility had an estimated 1,350 pounds (0.68 tons) of ethylene oxide point source emissions during the 12 month period ending December 31, 2016.

Analysis Demonstrating Whether Source is a Major Source - *Section 63.9(h)(E)*
Based on the above emissions, the facility emits less than 10 tons/year of ethylene oxide and is an area source.

Description of Air Pollution Control Device & Control Efficiency for Facility's Emission Points – *Section 63.9(h)(F)*
For Willowbrook I, a Deoxx Acid Wet Scrubber system demonstrated to have a control efficiency of 99.9996% treats emissions from the facility's sterilization chamber vents (i.e., vacuum pump emissions). Process emissions from the facility's aeration rooms are controlled using an AAT Acid Wet Scrubber/Drybed system. The control efficiency of this device during annual testing on January 23, 2003 was 99.9%.

For Willowbrook II, an AAT Acid Wet Scrubber system demonstrated to have a control efficiency of 99.94% treats emissions from the facility's sterilization chamber vents (i.e., vacuum pump emissions). Process emissions from the facility's aeration rooms are also controlled using the AAT Acid Wet Scrubber/Drybed system. The control efficiency of this device during annual testing was 99.96%.

Statement by Owner as to Whether the Facility Has Complied with the Relevant Standard – *Section 63.9(h)(G)*
To the best of our knowledge, our Willowbrook, IL facility has operated in compliance with the applicable standards in 40 CFR Part 63, Subpart O.

Sterigenics.

Certification Statement:
To the best of the undersigned's knowledge, information and belief formed after reasonable inquiry, the information submitted in this notification of compliance status for Sterigenics' Willowbrook, IL facility is true, accurate, and complete.

KAHoffman	13-Feb-2017	Kathleen Hoffman
Signature	*Date*	*Printed Name*

If you should need further information, please contact me at (630) 928-1771 or kwagner@sterigenics.com

Sincerely,

Kevin Wagner
Director, EH&S

cc: USEPA Region 5, Air Branch
USEPA (AR-17J)
Air & Radiation Division
77 West Jackson Blvd.
Chicago, Illinois 60604

Kathy Hoffman, Sterigenics– Sr. Vice-President EH&S and Technical Services
Juan Segovia, Sterigenics–Vice-President Operations
Shawn Pollino, Sterigenics–Willowbrook General Manager

REPORT OF
AIR POLLUTION SOURCE TESTING
OF AN ETHYLENE OXIDE EMISSION-CONTROL SYSTEM
OPERATED BY STERIGENICS, INC.
IN WILLOWBROOK, ILLINOIS
ON DECEMBER 12, 2016

Submitted to:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 North Grand Avenue East
Springfield, Illinois 62794

Submitted by:

STERIGENICS US, LLC.
2015 Spring Road
Oak Brook, Illinois 60523

I.D. Number 043110AAC

Prepared by:

ECSI, INC.
PO Box 848
San Clemente, California 92674-0848

January 20, 2017

ECSi

CONTACT SUMMARY

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STERIGENICS US, LLC.
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Willowbrook, Illinois 60521

Phone: (630)654-5151
FAX: (630)325-0020
email: jsegovia@sterigenics.com

TEST DATE

Monday, December 12, 2016

REGULATORY AGENCY

Brandon M. Nolen
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Illinois Environmental Protection Agency
1021 North Grand Avenue East
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TESTING CONTRACTOR

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email: dankremer@ecsi1.com

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1.0 INTRODUCTION

On Monday, December 12, 2016, ECSi, Inc. performed air pollution source testing of an ethylene oxide (EtO) emission-control device operated by Sterigenics, Inc. at their Willowbrook I facility, located at 7775 S. Quincy Street. The device tested was the Chemrox DEOXX packed tower scrubber emission-control system, which is used to control emissions from fourteen sterilizer vacuum pumps. The purpose of the testing program was to demonstrate continued compliance with the conditions established in the Air Quality Permit granted to Sterigenics by the Illinois Environmental Protection Agency (IEPA).

2.0 EQUIPMENT

The EtO gas-sterilization system is comprised of fourteen commercial sterilizers, which are discharged through liquid-ring vacuum pumps to a Chemrox DEOXX packed tower scrubber emission-control system. The gas-sterilization and emission-control equipment tested consists of the following:

- Fourteen Gas Sterilizers, each comprised of a steam-heated sterilization chamber, a recirculating vacuum pump chamber evacuation system, a backvent valve, and a fugitive emissions exhaust hood;

Sterilizer vacuum pump emissions are be controlled by:

- One Chemrox DEOXX packed tower chemical scrubber, equipped with a packed reaction/interface column, a scrubber fluid recirculation system, and a scrubber fluid reaction/storage tank.

3.0 TESTING

EtO source testing was conducted in accordance with the procedures outlined in USEPA CFR40, Part 63.365. EtO emissions monitoring was conducted simultaneously at the inlet and outlet of the packed tower scrubber during the first chamber evacuation of the sterilizer exhaust phase of one of the fourteen sterilizers. A total of three exhaust-phase test runs were performed.

During the first chamber evacuation of the exhaust phase, EtO emissions to the inlet of the packed tower scrubber were determined using the Ideal Gas Law and the chamber conditions at the beginning and at the end of the first chamber evacuation. During the first chamber evacuation of the exhaust phase, EtO emissions from the outlet of the packed tower scrubber were determined using direct source sample injection into the GC.

All exhaust phase testing was conducted during normal process load conditions, but with an empty sterilization chamber to facilitate inlet mass calculation and the performance of multiple test runs. The testing program was conducted in accordance with the procedures outlined in the following sections.

4.0 RULE/COMPLIANCE REQUIREMENTS

The EtO gas-sterilization system at Sterigenics was tested to demonstrate compliance with EPA requirements, as specified in the IEPA Air Quality Permit. The following requirements must be met:

- The sterilizer exhaust phase (post exposure vacuum pulses) emissions must be vented to control equipment with an EtO emission-reduction efficiency of at least 99 % by weight.

Testing is required to demonstrate compliance with these requirements. Source testing of the packed tower scrubber emission-control device is required initially, and may be required periodically thereafter.

5.0 TEST METHOD REFERENCE

5.1 INTRODUCTION

EtO source testing was conducted in accordance with the procedures outlined in USEPA CFR40, Part 63.365. EtO emissions monitoring was conducted simultaneously at the inlet and outlet of the packed tower scrubber during the first chamber evacuation of the sterilizer exhaust phase of one of the fourteen sterilizers. A total of three exhaust-phase test runs were performed.

Exhaust phase testing with one sterilizer discharging to the scrubber at a time represents worst-case conditions for demonstration of control efficiency compliance. At this lower inlet loading, the scrubber must perform at its maximum efficiency to achieve outlet EtO concentrations low enough to demonstrate compliance. One of the larger sterilizers was tested for each of the test runs to provide a realistic operational scenario.

During the first chamber evacuation of the exhaust phase, EtO emissions to the inlet of the packed tower scrubber were determined using the Ideal Gas Law and the chamber conditions at the beginning and at the end of the first chamber evacuation. During the first chamber evacuation of the exhaust phase, EtO emissions from the outlet of the packed tower scrubber were determined using direct source sample injection into the GC.

All exhaust phase testing was conducted during normal process load conditions, but with an empty sterilization chamber to facilitate inlet mass calculation and the performance of multiple test runs. The testing program was conducted in accordance with the procedures outlined in the following sections.

Operation and documentation of process conditions was performed by personnel from Sterigenics, Inc. using existing monitoring instruments installed by the manufacturer on the equipment to be tested. In accordance with the procedures established in USEPA CFR40, Part 63, Subpart O, scrubber liquor level was recorded.

5.2 VOLUMETRIC FLOW MEASUREMENT

Exhaust gas flow at the outlet of the scrubber was determined by 40 CFR 60, Appendix A, Method 2, using an s-type pitot tube and an inclined-oil manometer. Sampling ports were located in accordance with 40

CFR 60, Appendix A, Method 1. The test ports were located far enough from any flow disturbances to permit accurate flow measurement.

Temperature measurements were obtained from a type K thermocouple and thermometer attached to the sampling probe. Exhaust gas composition was assumed to be air and small amounts of water vapor. Water vapor was negligible and, based on previous test data, a value of 2 percent was used for flow calculations.

5.3 CONTROL EFFICIENCY AND MASS EMISSIONS MEASUREMENT

During the first chamber evacuation of the sterilizer exhaust phase, the mass emissions of EtO vented to the inlet of the scrubber were determined using the procedures outlined in CFR40, Part 63.365. This method allows the determination of the mass of EtO vented to the inlet of the scrubber through calculations based on the Ideal Gas Law and using the conditions (pressure, temperature, volume) of the sterilization chamber immediately after it has been charged with sterilant gas, and upon conclusion of the first chamber evacuation of the exhaust phase.

The mass of EtO vented to the inlet of the scrubber during the first chamber evacuation of the exhaust phase was determined by calculating the mass of EtO present in the chamber after the first chamber evacuation and subtracting it from the mass of EtO present in the chamber after it had been charged with sterilant gas. The mass of EtO present in the chamber was calculated using Equation 1, shown below in Section 5.9.

During the first chamber evacuation of the sterilizer exhaust phase, EtO emissions from the outlet were determined using direct source sample injection into the GC. The mass of EtO emitted from the outlet was determined using Equation 2, shown below in Section 5.9. Mass-mass control-efficiency of EtO during the sterilizer exhaust phase was calculated by comparing the mass of EtO vented to the system inlet to the mass of EtO vented from the system outlet.

During the sterilization chamber exhaust phase, vented gas was analyzed by an SRI, Model 8610, portable gas chromatograph (GC), equipped with the following: dual, heated sample loops and injectors; dual columns; and dual detectors. A photoionization detector (PID) was used to quantify low-level EtO emissions at the packed tower scrubber outlet.

5.4 SAMPLE TRANSPORT

Source gas was pumped to the GC at approximately 500-1000 cubic centimeters per minute (cc/min) from the sampling ports through two lengths of Teflon® sample line, each with a nominal volume of approximately 75 cubic centimeters (cc) and an outer diameter of 0.25 inch. At the outlet of the scrubber the sampling ports were located in the exhaust stack.

5.5 GC INJECTION

Source-gas samples were then injected into the GC which was equipped with two heated sampling loops, each containing a volume of approximately 2cc and maintained at 100 degrees Celsius (C). Injections occurred at approximately one-minute intervals during the sterilization chamber exhaust phase. Helium was the carrier gas for the PID.

5.6 GC CONDITIONS

The packed columns for the GC were both operated at 90 degrees C. The columns were stainless steel, 6 feet long, 0.125 inch outer diameter, packed with 1 percent SP-1000 on 60/80 mesh Carbopack B.

Any unused sample gas was vented from the GC system back to the inlet of the scrubber.

5.7 CALIBRATION STANDARDS

The PID was calibrated for low-range ppmv level analyses using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

Each of these calibration standards was in a separate, certified manufacturer's cylinder. Copies of the calibration gas laboratory certificates are attached as Appendix F.

5.8 SAMPLING DURATION

Exhaust phase EtO measurements were taken for the entire duration of the first chamber evacuation, which was approximately 10-20 minutes. This encompassed a total sampling duration of approximately 10-20 minutes for each exhaust phase test run.

5.9 CONTROL-EFFICIENCY/MASS-EMISSIONS CALCULATIONS

The following equation was used to calculate mass of EtO discharged to the inlet of the emission-control system during the first chamber evacuation of the sterilizer exhaust phase:

EQUATION 1:

$W_c = W_{ci} - W_{cf}$

Where:

W_c = Weight of EtO discharged from the sterilization chamber to the emission-control system during the first chamber evacuation, pounds

W_{ci} = (mw)(p)(P)(V)/(R)(T)

(and W_{cf})

Where:

W_{ci} = Weight of EtO present in the sterilization chamber before the first chamber evacuation, pounds

W_{cf} = Weight of EtO present in the sterilization chamber after the first chamber evacuation, pounds

MW = Molecular weight of EtO, 44.05 lb/mol

p = Percent of EtO in chamber

= W_s/W_i

Where:

W_s = Scale-measured weight of EtO charged into sterilization chamber

W_i = Calculated weight of EtO charged into sterilization chamber (@ 100%)

P = Sterilization chamber pressure (after charging/at the end of the 1st evac), psia

V = Sterilization chamber volume, ft^3

R = Gas constant, 10.73 psia·ft^3/mol·°R

T = Sterilization chamber temperature (after charging/at the end of the 1st evac), °R

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Note: Standard conditions are 68°F and 1 atm.

Mass emissions of EtO during the exhaust phase were calculated using the following equation:

EQUATION 2:

$$MassRate = (VolFlow)(MolWt)(ppmv\ EtO/10^6)/(MolVol)$$

Where:

MassRate	=	EtO mass flow rate, pounds per minute
VolFlow	=	Corrected volumetric flow rate, standard cubic feet per minute at 68 degrees F
MolWt	=	44.05 pounds EtO per pound mole
ppmv EtO	=	EtO concentration, parts per million by volume
10^6	=	Conversion factor, ppmv per "cubic foot per cubic foot"
MolVol	=	385.32 cubic feet per pound mole at one atmosphere and 68 degrees F

Results of the control-efficiency testing are presented in Section 8.0 and in Table 1.

6.0 TEST SCENARIO

During exhaust phase testing, each sterilizer was tested during normal process load conditions, but with an empty sterilization chamber to facilitate the performance of multiple test runs. A total of three exhaust-phase test runs were performed to verify the performance of the emission-control device. Testing was conducted with an effort to offer minimal disruption to the Sterigenics production schedule. The testing schedule was as follows:

1) Testing equipment was set up and calibrated.
2) An empty-chamber cycle was started in one of the larger sterilizers. This sterilizer was isolated for test use and designated as a test chamber.
3) Exhaust Phase Test Run #1 was conducted. Sampling was performed at outlet of the scrubber during the first chamber evacuation of the test chamber. During the performance of the test, only the sterilizer used for the test was allowed to discharge to the Chemrox scrubber.
4) An empty-chamber cycle was started in another of the larger sterilizers. This sterilizer was isolated for test use and designated as a test chamber.
5) Exhaust Phase Test Run #2 was conducted. Sampling was performed at outlet of the scrubber during the first chamber evacuation of the test chamber. During the performance of the test, only the sterilizer used for the test was allowed to discharge to the Chemrox scrubber.
6) An empty-chamber cycle was started in another of the larger sterilizers. This sterilizer was isolated for test use and designated as a test chamber.
7) Exhaust Phase Test Run #3 was conducted. Sampling was performed at outlet of the scrubber during the first chamber evacuation of the test chamber. During the performance of the test, only the sterilizer used for the test was allowed to discharge to the Chemrox scrubber.
8) Post calibration check was performed, testing equipment was packed.

7.0 QA/QC

7.1 FIELD TESTING QUALITY ASSURANCE

At the beginning of the test, the sampling system was leak checked at a vacuum of 15 inches of mercury. The sampling system was considered leak free when the flow indicated by the rotameters fell to zero.

At the beginning of the test, a system blank was analyzed to ensure that the sampling system was free of EtO. Ambient air was introduced at the end of the heated sampling line and drawn through the sampling system line to the GC for analysis. The resulting chromatogram also provided a background level for non-EtO components (i.e. ambient air, carbon dioxide, water vapor) which are present in the source gas stream due to the ambient dilution air which is drawn into the emission-control device, and due to the destruction of EtO by the emission-control device which produces carbon dioxide and water vapor. This chromatogram, designated AMB, is included with the calibration data in Appendix A.

7.2 CALIBRATION PROCEDURES

The GC system was calibrated at the beginning and conclusion of each day's testing. Using the Peaksimple II analytical software, a point-to-point calibration curve was constructed for each detector. A gas cylinder of similar composition as the calibration gases, but certified by a separate supplier, was used to verify calibration gas composition and GC performance.

All calibration gases and support gases used were of the highest purity and quality available. A copy of the laboratory certification for each calibration gas is attached as Appendix F.

8.0 TEST RESULTS

The Ceilcote scrubber demonstrated an EtO control efficiency of 99.9996 percent. In accordance with EPA requirements, as specified in the IEPA Air Quality Permit, this control equipment must have an EtO control efficiency of 99 percent or more during the sterilizer exhaust phase (vacuum pump emissions). The emission-control device met this requirement.

The test results are summarized in Table 1. These tables include results for EtO control efficiency of the emission-control device. Chromatograms and chromatographic supporting data are attached as Appendices A through D. Copies of field data and calculation worksheets are attached as Appendix E.

TABLES

TABLE 1
ETHYLENE OXIDE CONTROL EFFICIENCY
OF A CHEMROX DEOXX PACKED TOWER SCRUBBER EMISSION CONTROL DEVICE
OPERATED BY STERIGENICS, INC.
IN WILLOWBROOK, ILLINOIS (PLANT 1)
DECEMBER 12, 2016

Run #	Stack Flow (dscfm) (2)	Average Outlet Conc. (ppm) (1)	Outlet EtO Mass Flow (lbs/min) (3)	Minutes/ Cycle	Outlet EtO Mass Emissions (lbs)	Inlet EtO Mass Emissions (lbs)	EtO Control Efficiency (%)
#1	63.8	0.3021	0.0000022	19	0.0000419	47.4	99.9999
#2	65.4	1.325	0.0000099	17	0.0001683	50.8	99.9997
#3	140	0.010	0.0000002	11	0.0000019	39.3	100.0000
						Average EtO Control Efficiency:	**99.9999**
						Required EtO Control Efficiency:	**99**

Notes: (1) - PPM = parts per million by volume
(2) - DSCFM = dry standard cubic feet per minute
(3) - LBS/MIN = EtO emissions, pounds per minute
(4) - Testing was performed with the scrubber liquor level at 181 inches.

ECSi

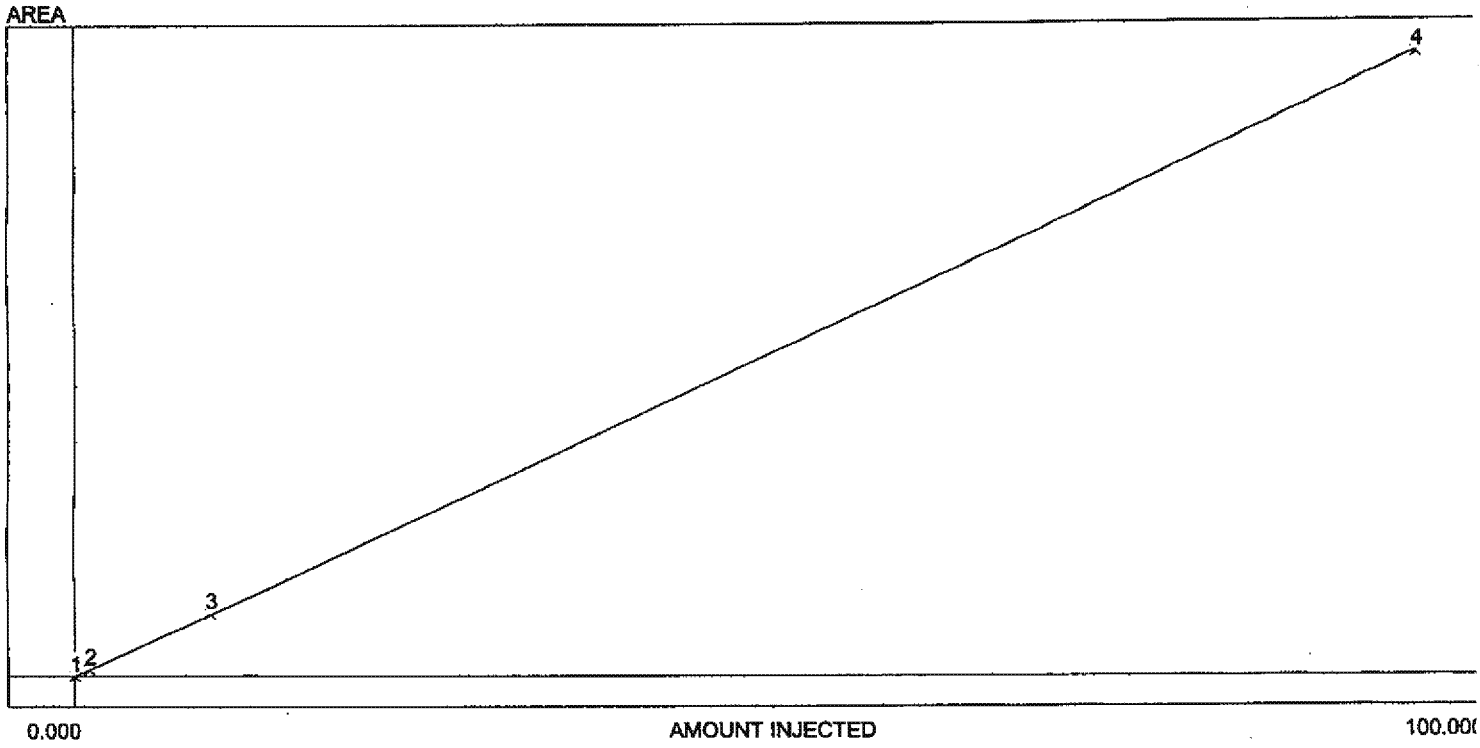
APPENDICES

APPENDIX A

Calibration Data

ak	Name	Start	End	Calibration	Int.Std	Units
	Dead Vol / Air	0.000	0.350		0.000	
	Ambient H2O	0.350	0.500		0.000	
	Ethylene Oxide	0.500	0.600	C:\peak359\1Ster	0.00016	ppm
	Acetaldehyde	0.600	0.800		0.000	
	CO2	0.800	1.000		0.000	

ibration file: C:\peak359\1SterWB2016.cal

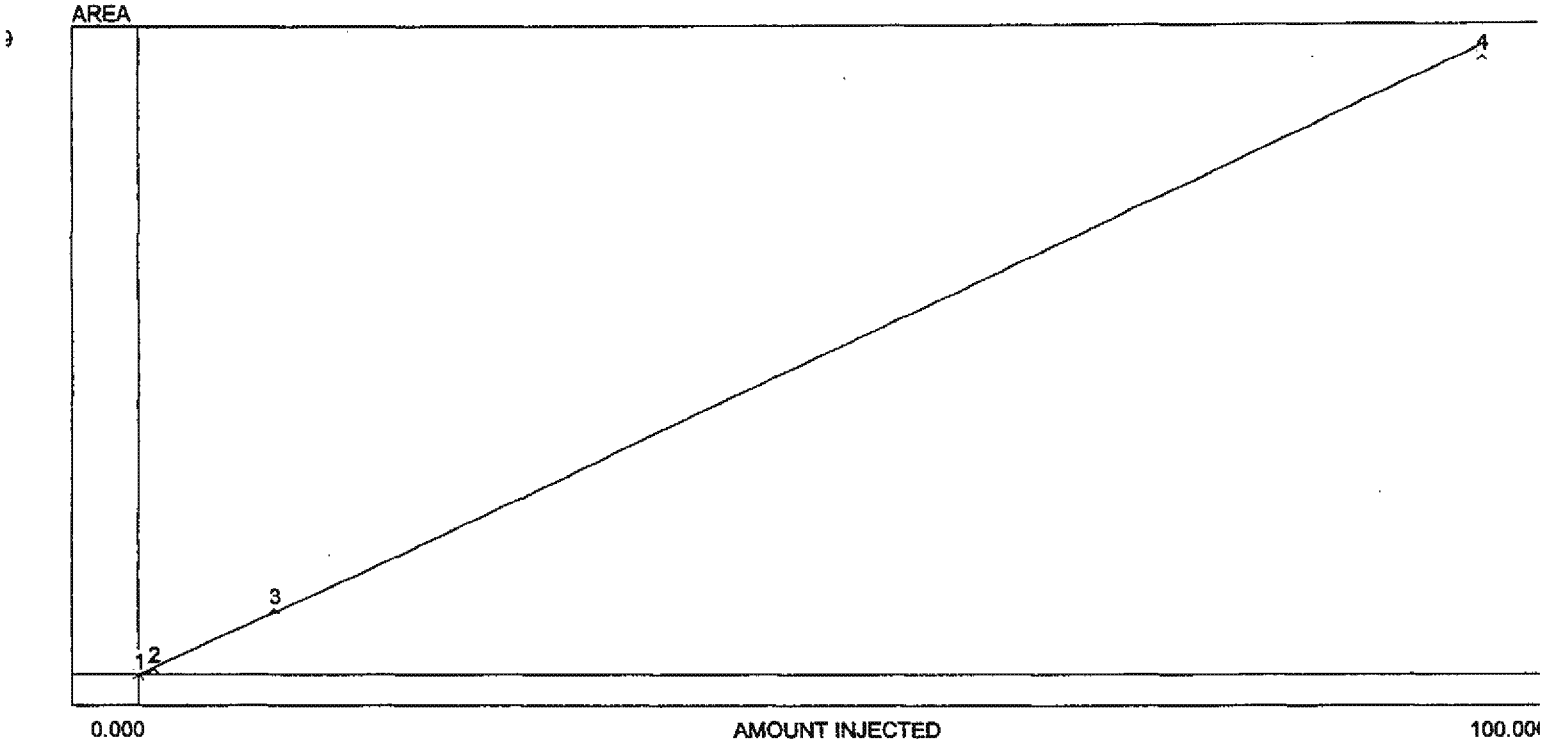


ı slope of curve: 0.43
xis intercept: 0.00
earity: 1.00
nber of levels: 4
'rel SD of CF's: 0.2/66.7
).4316X
1.0000
:t calibrated: Fri Dec 02 08:01:11 2016

Area/ht.	Amount	CF	Current	Previous #1	Previous #2
0.000	0.000	0.000	0.000	N/A	N/A
0.470	1.100	0.427	0.470	N/A	N/A
4.420	10.100	0.438	4.420	N/A	N/A
43.000	100.000	0.430	43.000	N/A	N/A

ak	Name	Start	End	Calibration	Int.Std	Units
	Dead Vol / Air	0.000	0.350		0.000	
	Ambient H2O	0.350	0.500		0.000	
	Ethylene Oxide	0.500	0.600	C:\peak359\2Ster	0.000	16.ppm
	Acetaldehyde	0.600	0.800		0.000	
	CO2	0.800	1.000		0.000	

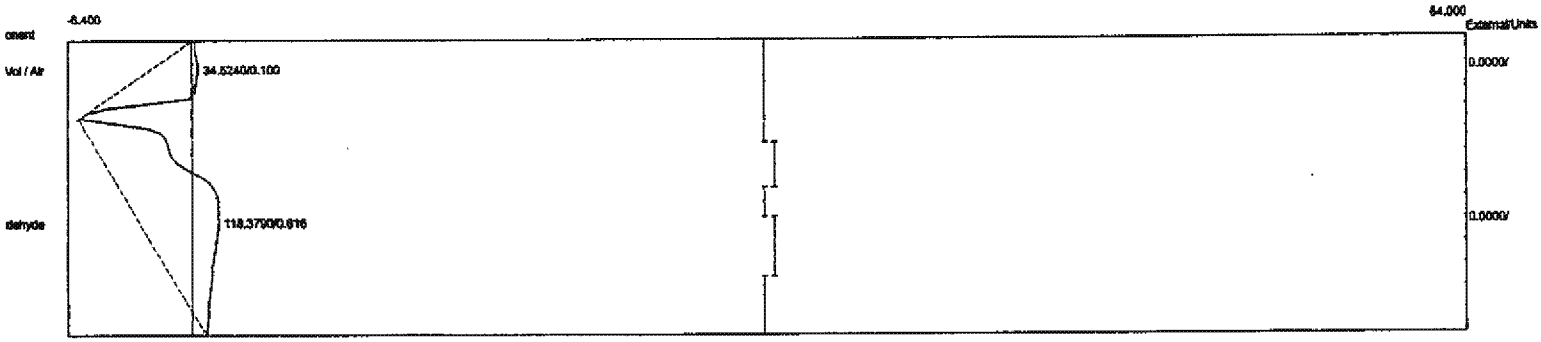
libration file: C:\peak359\2SterWB2016.cal



ı slope of curve: 1.82
uxis intercept: 0.00
earity: 1.00
nber of levels: 4
/rel SD of CF's: 0.9/67.0
1.8223X
0.9999
it calibrated: Fri Dec 02 08:00:23 2016

Area/ht.	Amount	CF	Current	Previous #1	Previous #2
0.000	0.000	0.000	0.000	N/A	N/A
1.910	1.100	1.736	1.910	N/A	N/A
19.600	10.100	1.941	19.600	N/A	N/A
179.000	100.000	1.790	179.000	N/A	N/A

Client: Sterigenics - Willowbrook 1
Client ID: PreCal
ıalysis date: 12/12/2016 14:15:28
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E.CHR (c:\peak359)
Sample: Ambient Background
Operator: D. Kremer

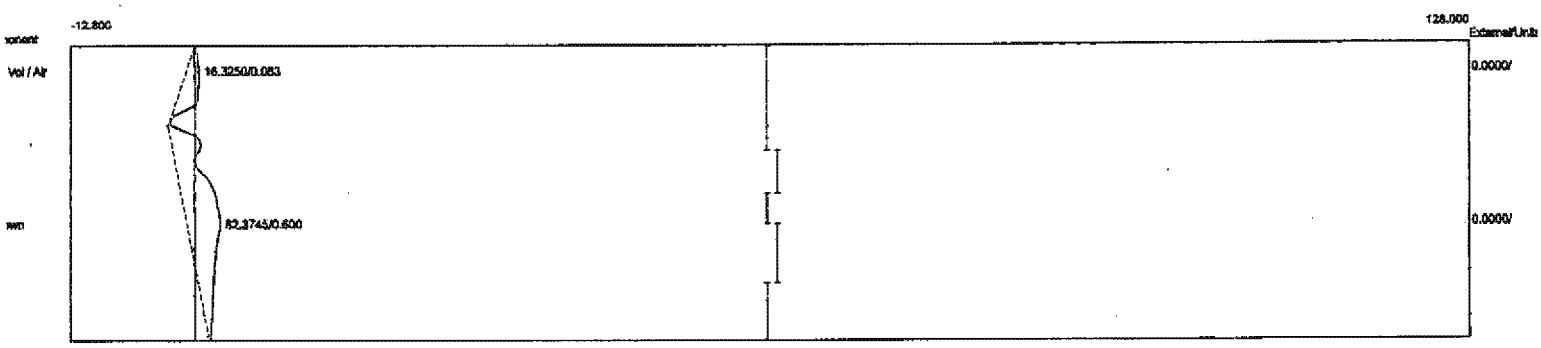


Component	Retention	Area	External	Units
ad Vol / Air	0.100	34.5240	0.0000	
etaldehyde	0.616	118.3790	0.0000	
		152.9030	0.0000	

APPENDIX B

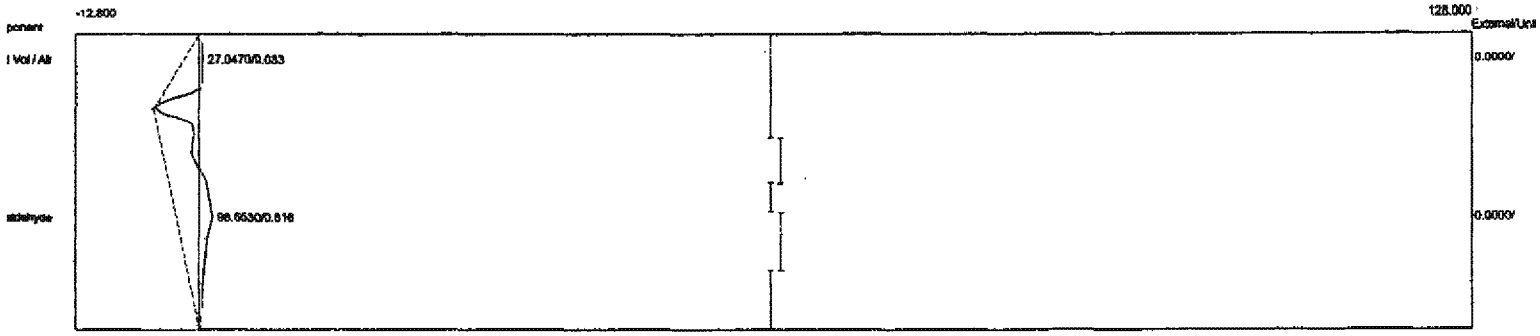
Run#1 Chromatograms

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
ıalysis date: 12/12/2016 14:32:37
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E01.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



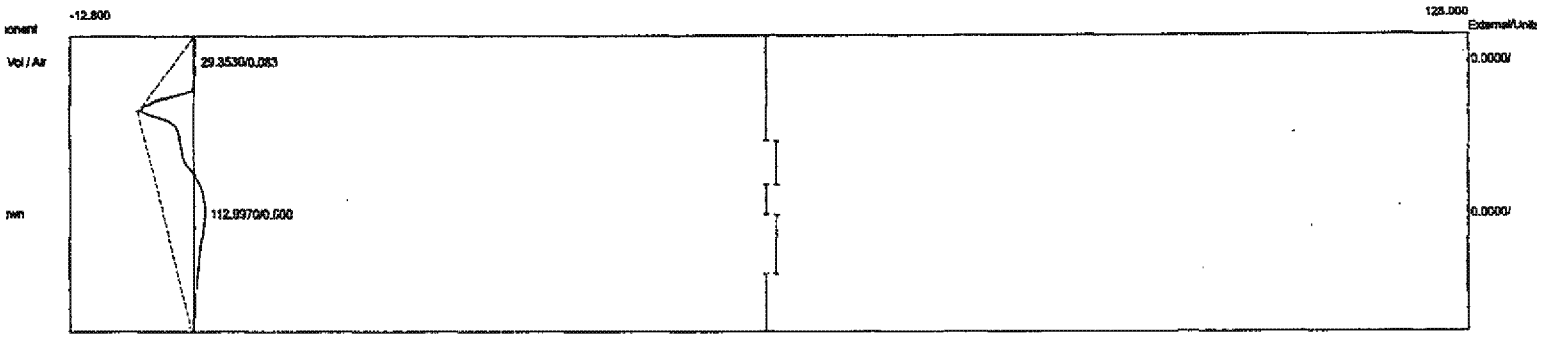
Component	Retention	Area	External	Units
ad Vol / Air	0.083	16.3250	0.0000	
		16.3250	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:34:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster1WB2016-1E02.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



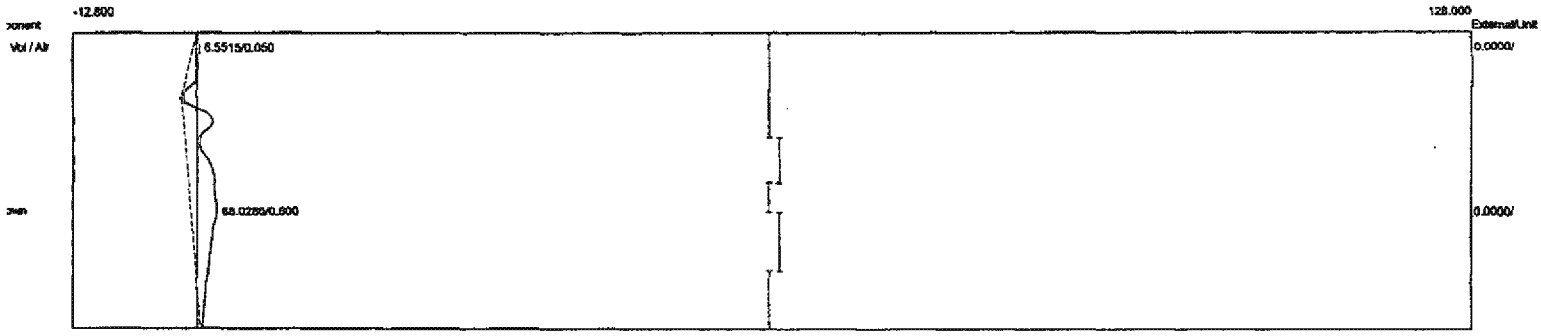
Component	Retention	Area	External	Units
ad Vol / Air	0.083	27.0470	0.0000	
etaldehyde	0.616	98.6530	0.0000	
		125.7000	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:35:21
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E03.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



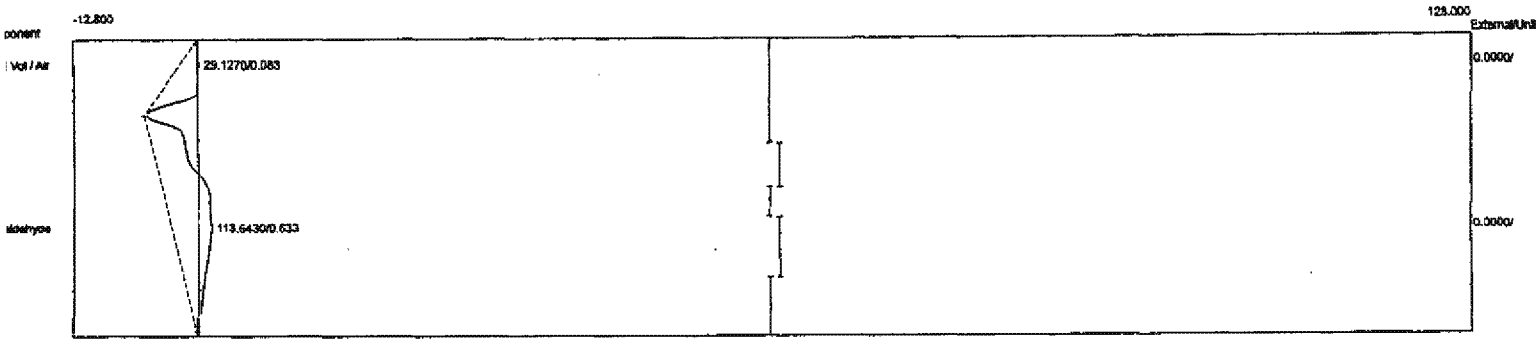
Component	Retention	Area	External	Units
ad Vol / Air	0.083	29.3530	0.0000	
		29.3530	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:36:33
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E04.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



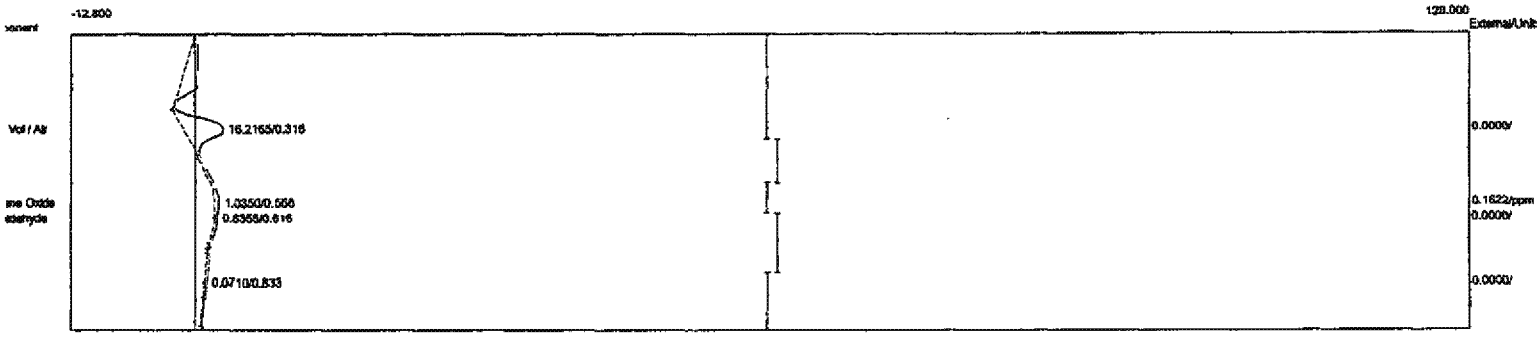
Component	Retention	Area	External	Units
ad Vol / Air	0.050	6.5515	0.0000	
		6.5515	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:37:45
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E05.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



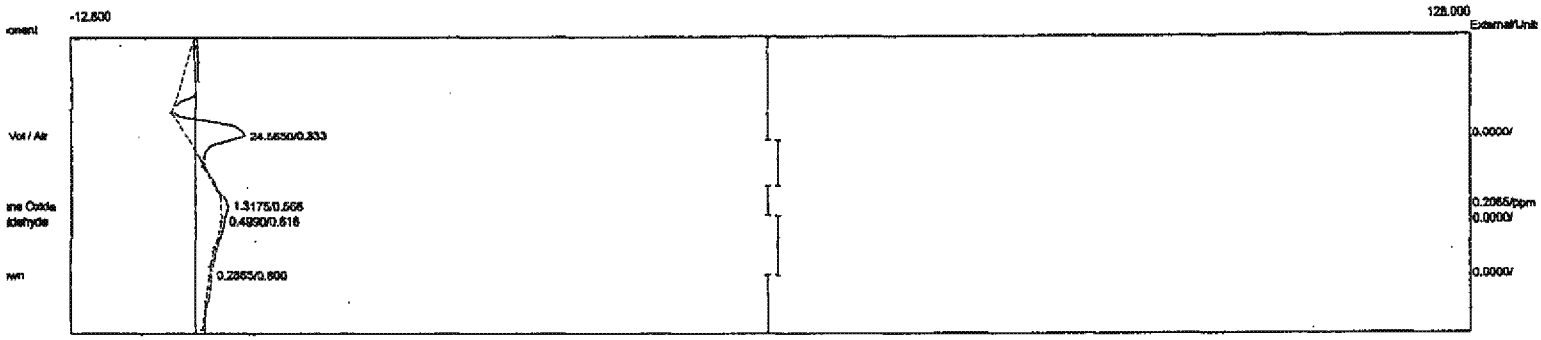
Component	Retention	Area	External	Units
ad Vol / Air	0.083	29.1270	0.0000	
etaldehyde	0.633	113.6430	0.0000	
		142.7700	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:39:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E06.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



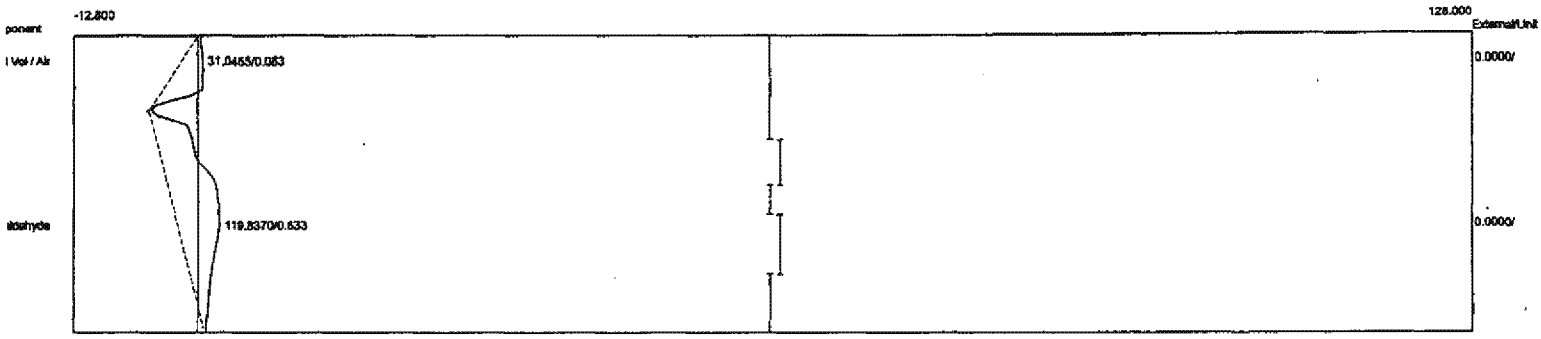
Component	Retention	Area	External	Units
ad Vol / Air	0.316	16.2165	0.0000	
ylene Oxide	0.566	1.0350	0.1622	ppm
etaldehyde	0.616	0.6355	0.0000	
2	0.833	0.0710	0.0000	
		17.9580	0.1622	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
ıalysis date: 12/12/2016 14:40:18
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E07.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



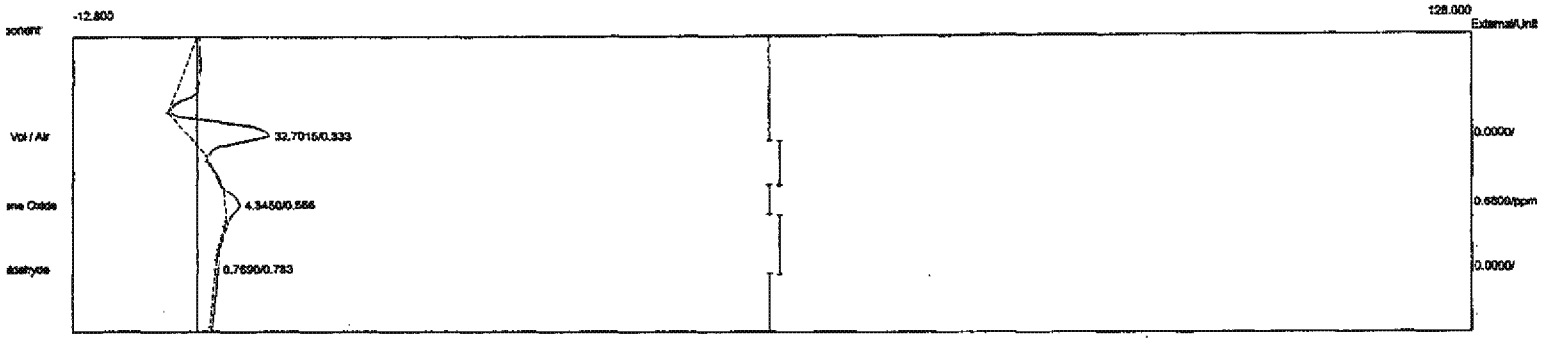
Component	Retention	Area	External	Units
ad Vol / Air	0.333	24.6650	0.0000	
ıylene Oxide	0.566	1.3175	0.2065	ppm
ɜtaldehyde	0.616	0.4990	0.0000	
		26.4815	0.2065	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:41:35
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E08.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



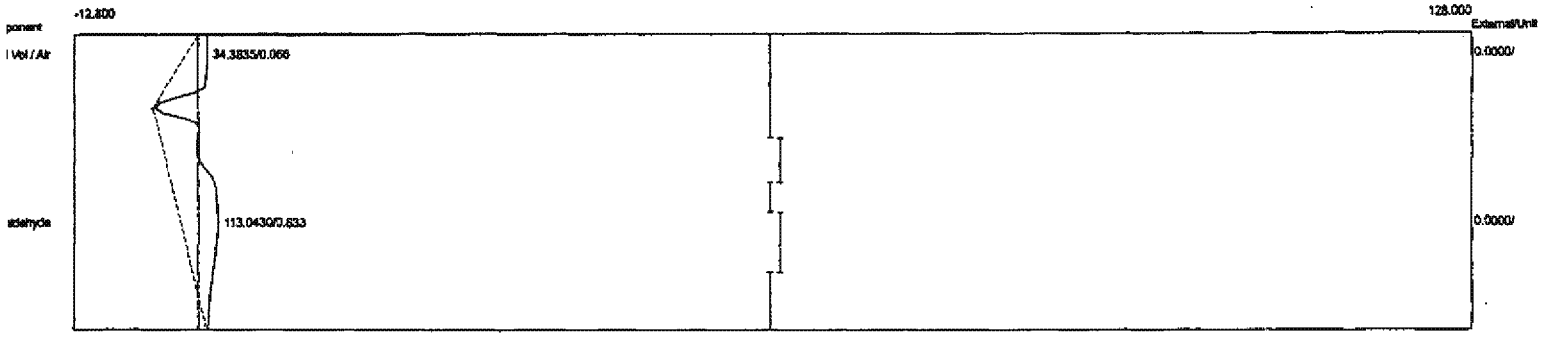
Component	Retention	Area	External	Units
ad Vol / Air	0.083	31.0455	0.0000	
etaldehyde	0.633	119.8370	0.0000	
		150.8825	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:42:48
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E09.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



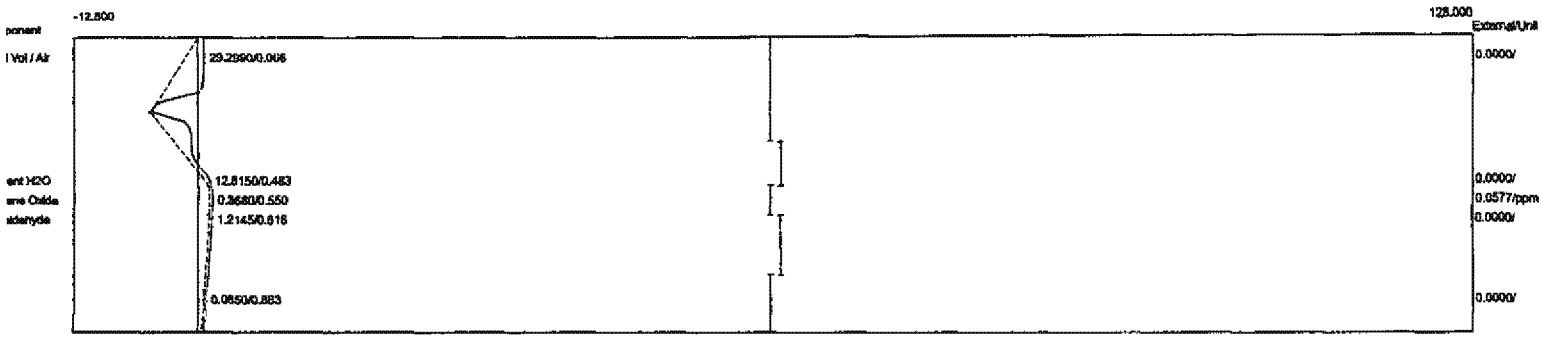
Component	Retention	Area	External	Units
ad Vol / Air	0.333	32.7015	0.0000	
ıylene Oxide	0.566	4.3450	0.6809	ppm
etaldehyde	0.783	0.7690	0.0000	
		37.8155	0.6809	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:44:00
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E10.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



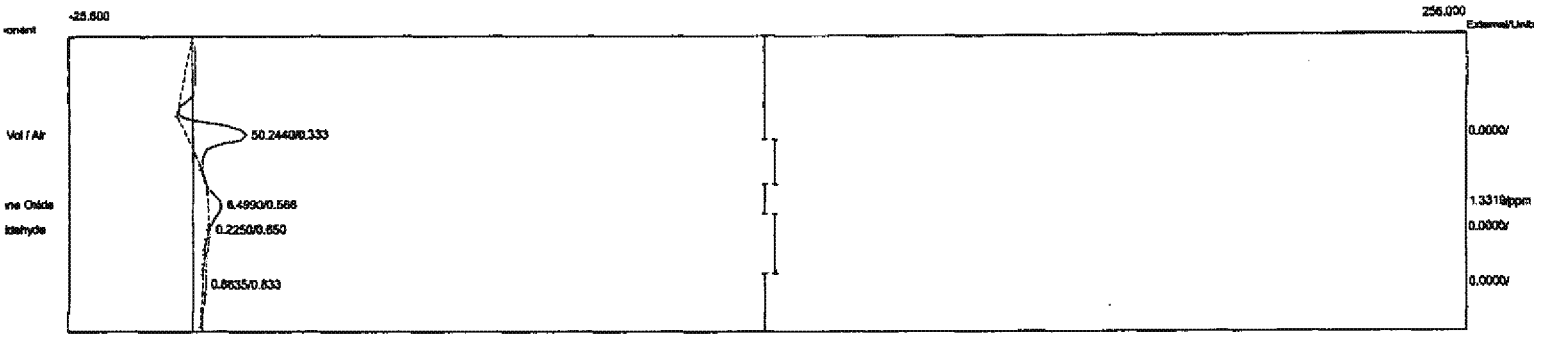
Component	Retention	Area	External	Units
ad Vol / Air	0.066	34.3835	0.0000	
etaldehyde	0.633	113.0430	0.0000	
		147.4265	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:45:13
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E11.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



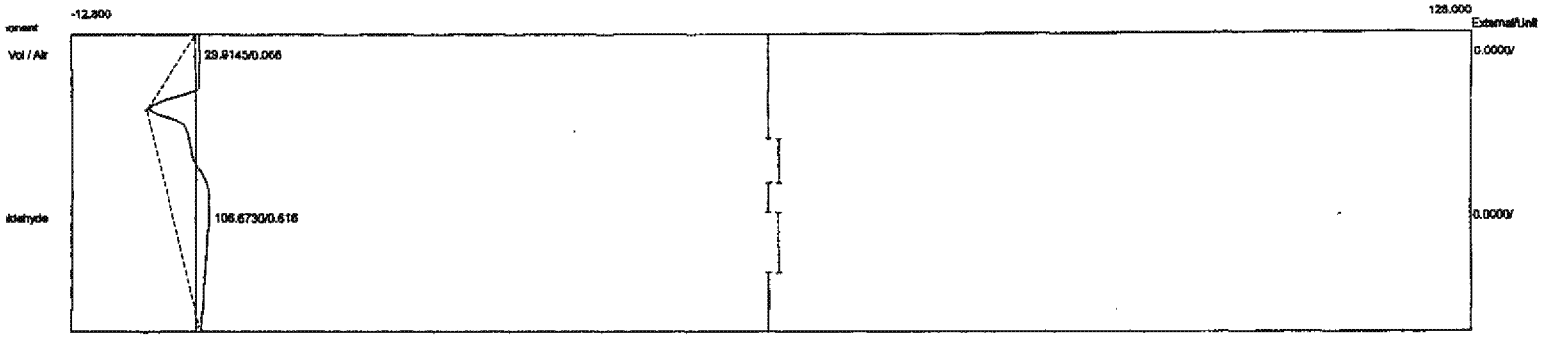
Component	Retention	Area	External	Units
ad Vol / Air	0.066	29.2990	0.0000	
ıbient H2O	0.483	12.8150	0.0000	
ıylene Oxide	0.550	0.3680	0.0577	ppm
etaldehyde	0.616	1.2145	0.0000	
)2	0.883	0.0850	0.0000	
		43.7815	0.0577	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
ıalysis date: 12/12/2016 14:46:44
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E12.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



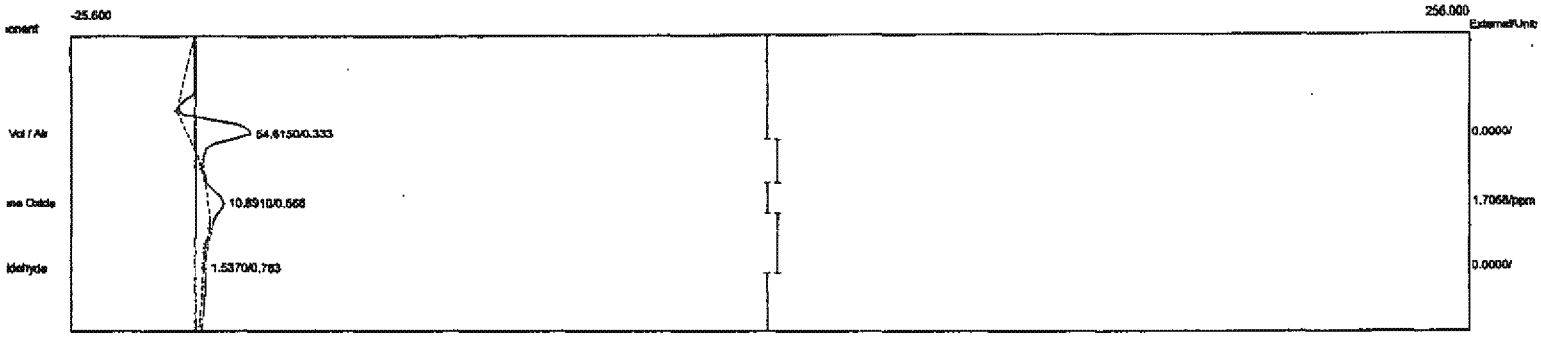
Component	Retention	Area	External	Units
ad Vol / Air	0.333	50.2440	0.0000	
ıylene Oxide	0.566	8.4990	1.3319	ppm
etaldehyde	0.650	0.2250	0.0000	
ı2	0.833	0.8635	0.0000	
		59.8315	1.3319	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:48:15
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E13.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.066	29.9145	0.0000	
etaldehyde	0.616	106.6730	0.0000	
		136.5875	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
ıalysis date: 12/12/2016 14:49:35
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E14.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer

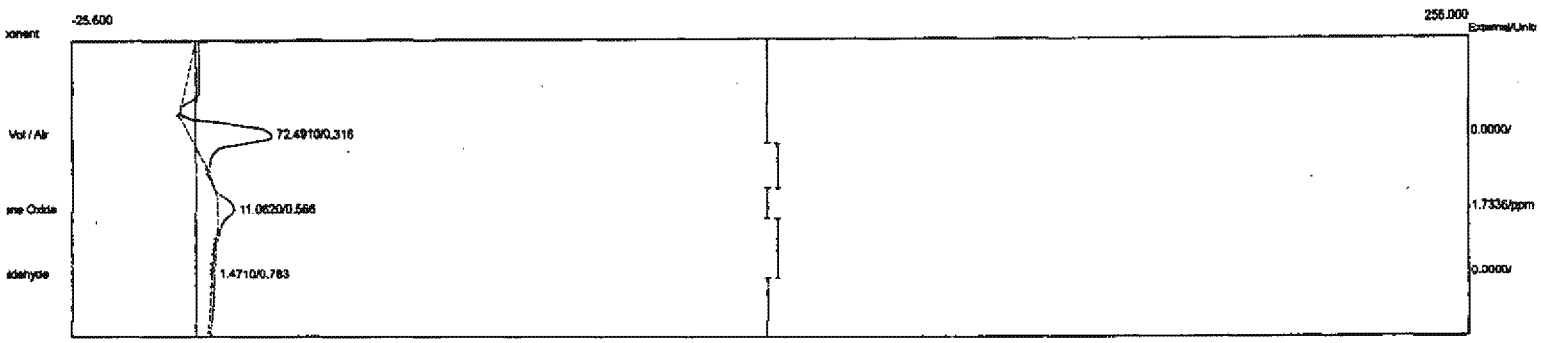


Component	Retention	Area	External	Units
ad Vol / Air	0.333	54.6150	0.0000	
ıylene Oxide	0.566	10.8910	1.7068	ppm
etaldehyde	0.783	1.5370	0.0000	
		67.0430	1.7068	

APPENDIX C

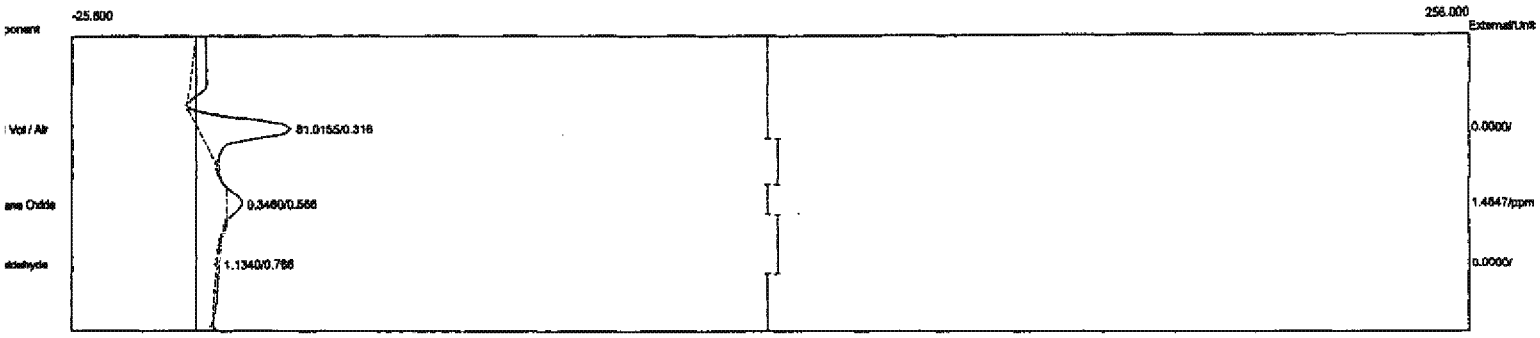
Run#2 Chromatograms

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
ıalysis date: 12/12/2016 15:01:53
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E01.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



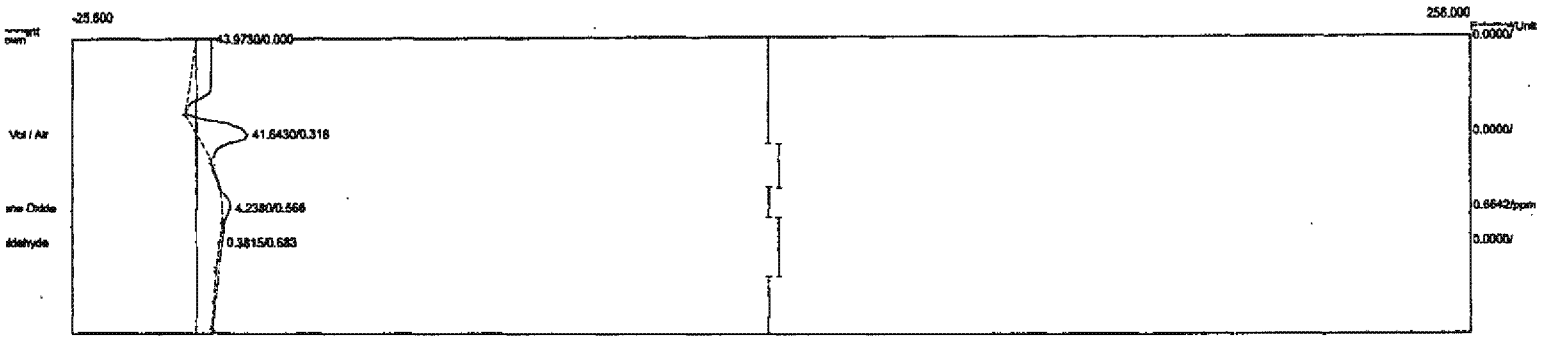
Component	Retention	Area	External	Units
ad Vol / Air	0.316	72.4910	0.0000	
ıylene Oxide	0.566	11.0620	1.7336	ppm
etaldehyde	0.783	1.4710	0.0000	
		85.0240	1.7336	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
nalysis date: 12/12/2016 15:03:31
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E02.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



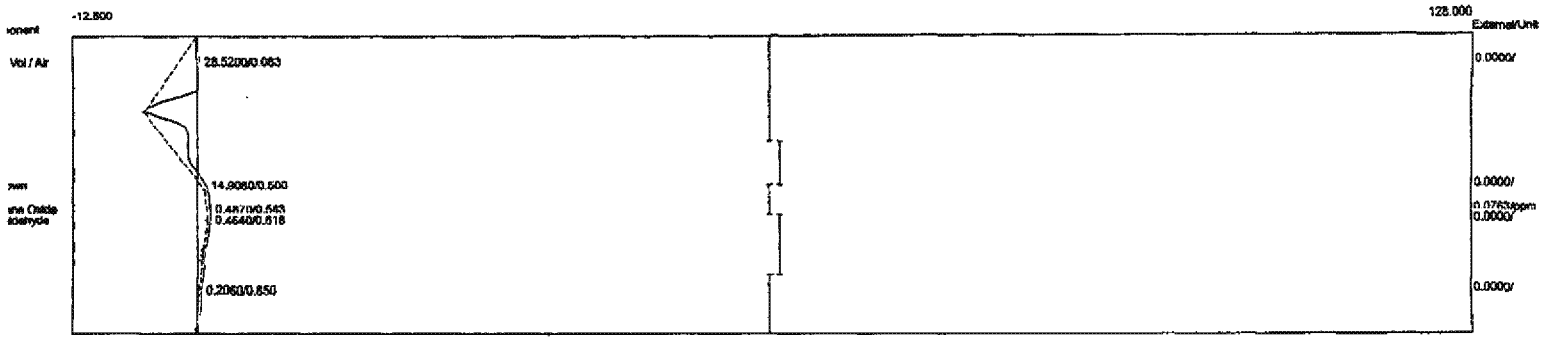
Component	Retention	Area	External	Units
ad Vol / Air	0.316	81.0155	0.0000	
ıylene Oxide	0.566	9.3460	1.4647	ppm
etaldehyde	0.766	1.1340	0.0000	
		91.4955	1.4647	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
nalysis date: 12/12/2016 15:04:46
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E03.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



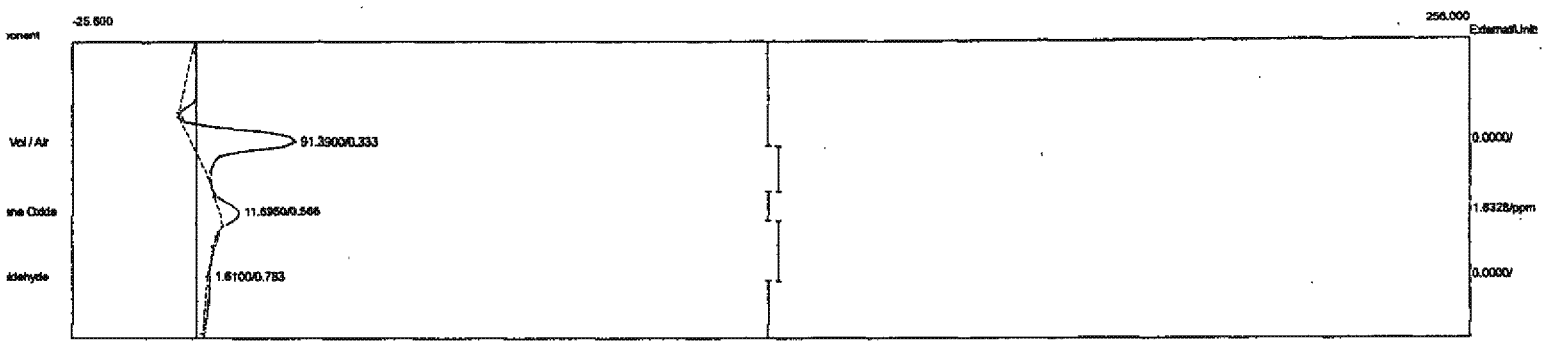
Component	Retention	Area	External	Units
ad Vol / Air	0.316	41.6430	0.0000	
ıylene Oxide	0.566	4.2380	0.6642	ppm
etaldehyde	0.683	0.3815	0.0000	
		46.2625	0.6642	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
ıalysis date: 12/12/2016 15:06:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
·omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E04.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



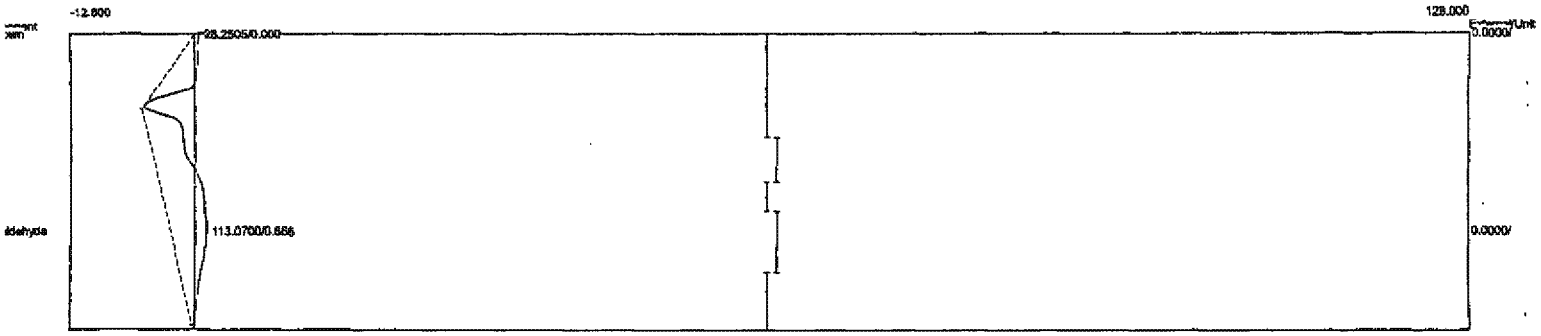
Component	Retention	Area	External	Units
ad Vol / Air	0.083	28.5200	0.0000	
ıylene Oxide	0.583	0.4870	0.0763	ppm
ɜtaldehyde	0.616	0.4640	0.0000	
ı2	0.850	0.2060	0.0000	
		29.6770	0.0763	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
nalysis date: 12/12/2016 15:07:25
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E05.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



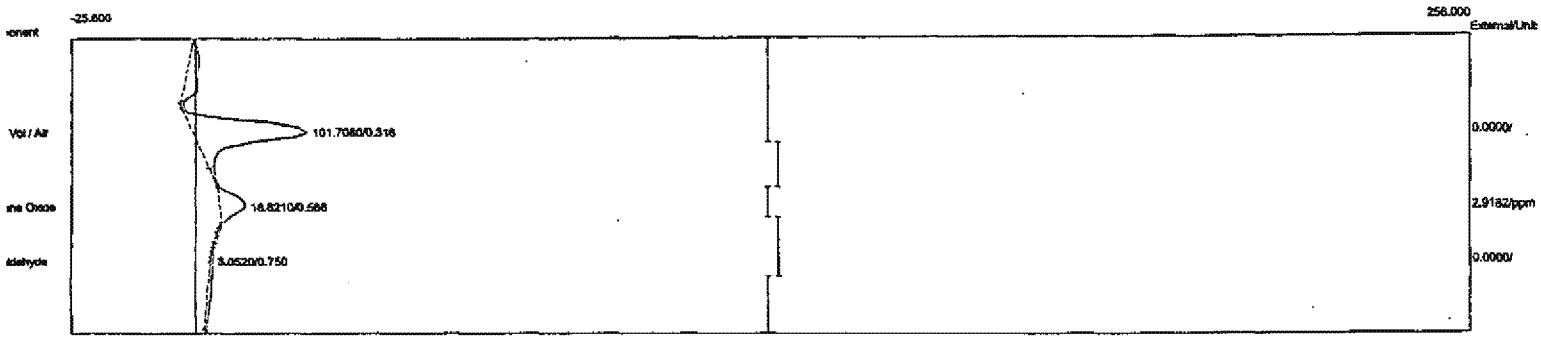
Component	Retention	Area	External	Units
ad Vol / Air	0.333	91.3900	0.0000	
ylene Oxide	0.566	11.6950	1.8328	ppm
staldehyde	0.783	1.6100	0.0000	
		104.6950	1.8328	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
nalysis date: 12/12/2016 15:08:38
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E06.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



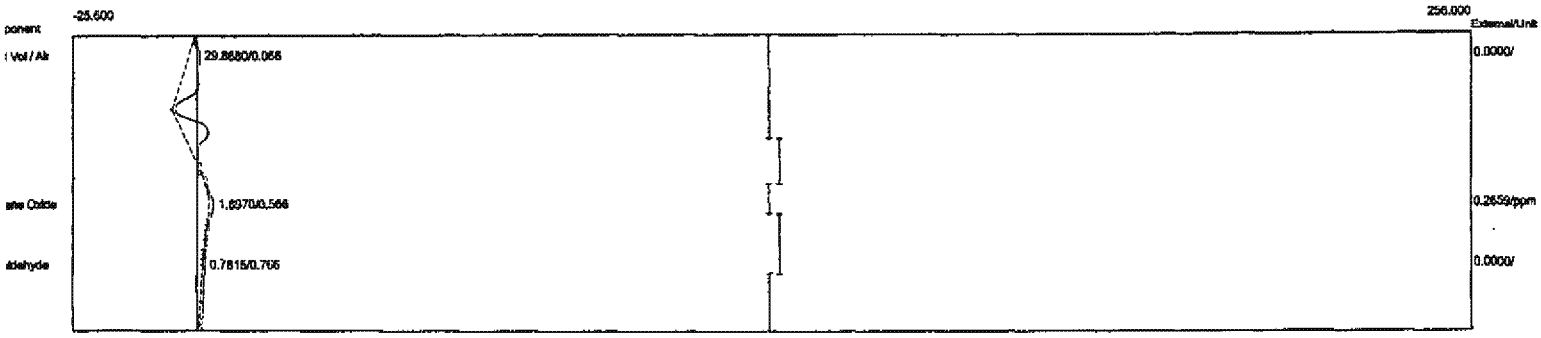
Component	Retention	Area	External	Units
etaldehyde	0.666	113.0700	0.0000	
		113.0700	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
ıalysis date: 12/12/2016 15:09:46
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E07.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



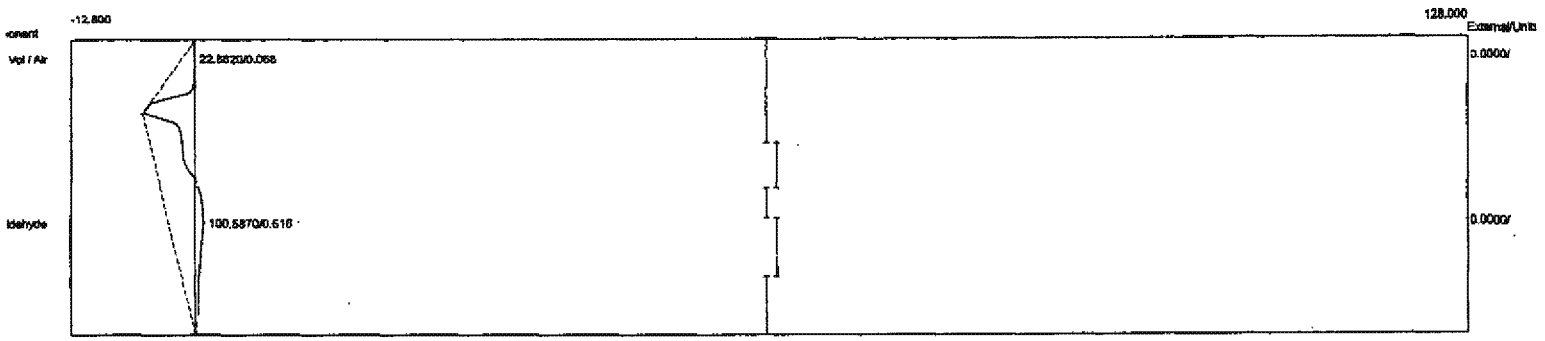
Component	Retention	Area	External	Units
ad Vol / Air	0.316	101.7080	0.0000	
ıylene Oxide	0.566	18.6210	2.9182	ppm
etaldehyde	0.750	3.0520	0.0000	
		123.3810	2.9182	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
nalysis date: 12/12/2016 15:11:10
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E08.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



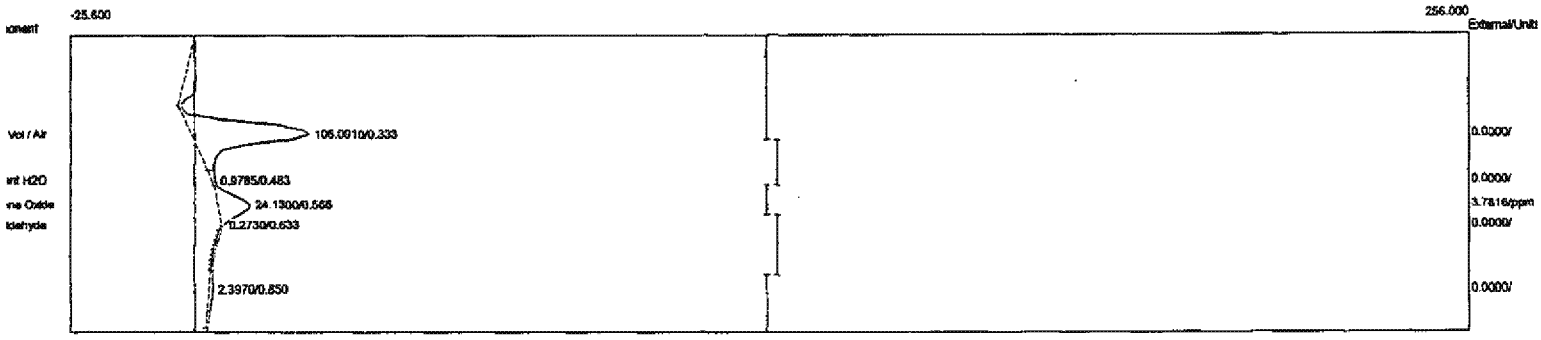
Component	Retention	Area	External	Units
ad Vol / Air	0.066	29.8680	0.0000	
ıylene Oxide	0.566	1.6970	0.2659	ppm
etaldehyde	0.766	0.7815	0.0000	
		32.3465	0.2659	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
nalysis date: 12/12/2016 15:12:28
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E09.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



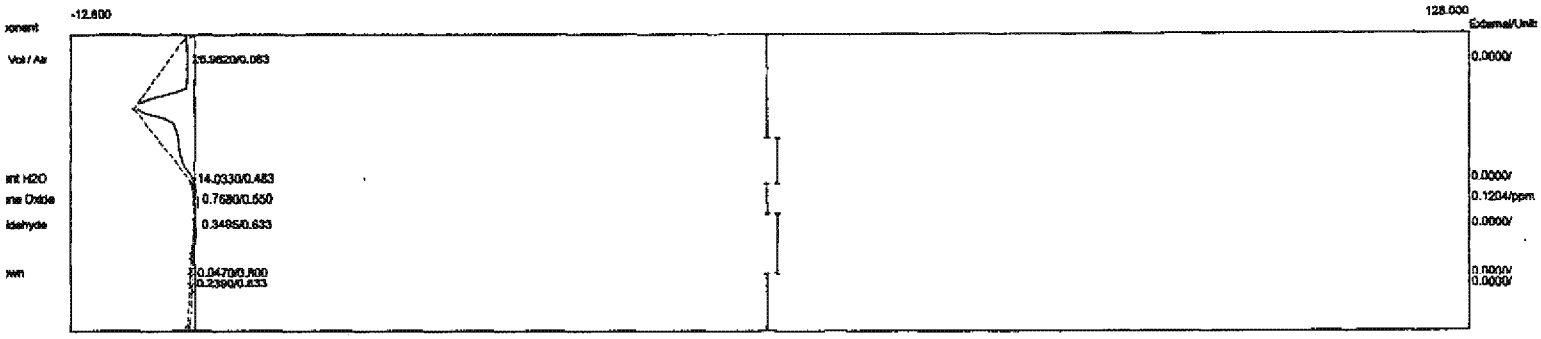
Component	Retention	Area	External	Units
ad Vol / Air	0.066	22.8820	0.0000	
etaldehyde	0.616	100.5870	0.0000	
		123.4690	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
ıalysis date: 12/12/2016 15:13:41
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E10.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



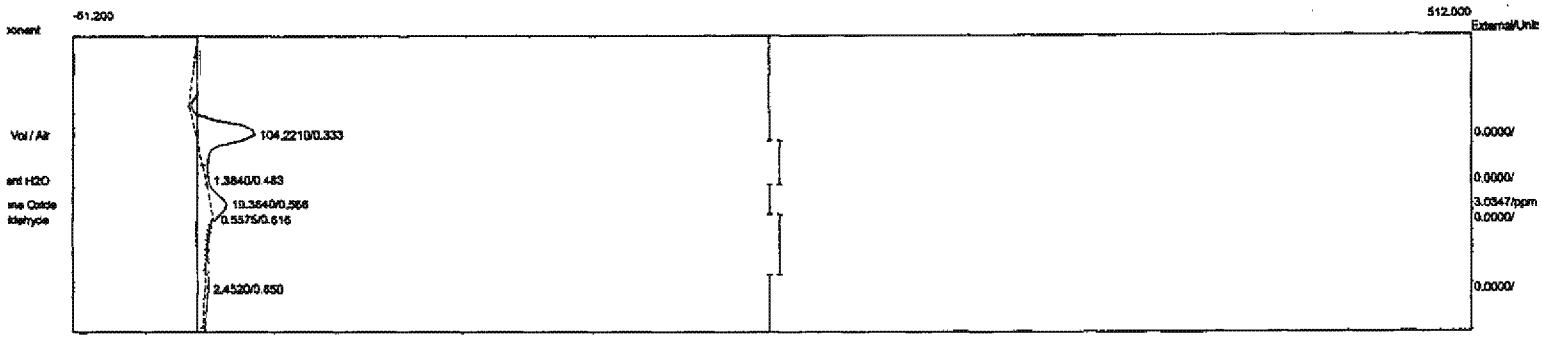
Component	Retention	Area	External	Units
ad Vol / Air	0.333	106.0910	0.0000	
ıbient H2O	0.483	0.9785	0.0000	
ıylene Oxide	0.566	24.1300	3.7816	ppm
ɜtaldehyde	0.633	0.2730	0.0000	
ı2	0.850	2.3970	0.0000	
		133.8695	3.7816	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
ıalysis date: 12/12/2016 15:15:13
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E11.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.083	26.9820	0.0000	
ıbient H2O	0.483	14.0330	0.0000	
ıylene Oxide	0.550	0.7680	0.1204	ppm
etaldehyde	0.633	0.3495	0.0000	
ı2	0.833	0.2390	0.0000	
		42.3715	0.1204	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
ıalysis date: 12/12/2016 15:16:33
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E12.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer

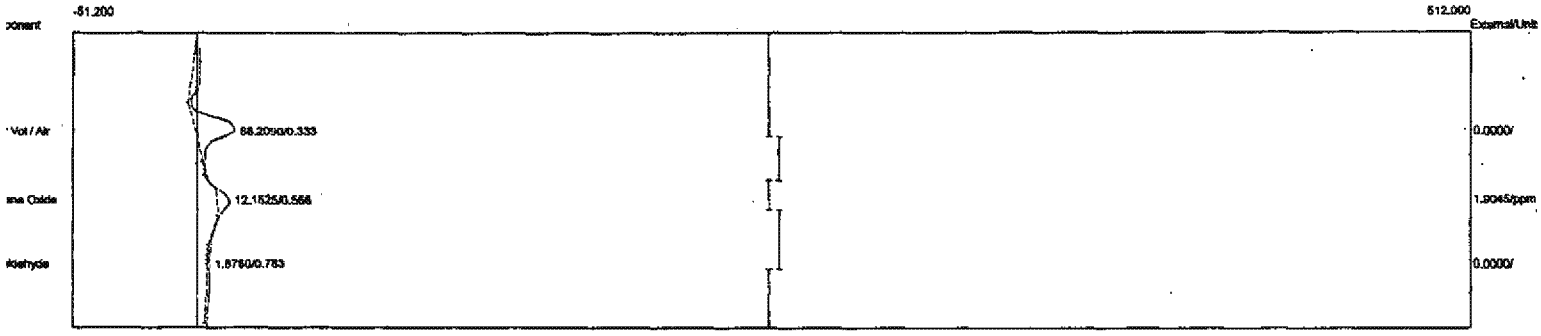


Component	Retention	Area	External	Units
ad Vol / Air	0.333	104.2210	0.0000	
ıbient H2O	0.483	1.3840	0.0000	
ıylene Oxide	0.566	19.3640	3.0347	ppm
etaldehyde	0.616	0.5575	0.0000	
ı2	0.850	2.4520	0.0000	
		127.9785	3.0347	

APPENDIX D

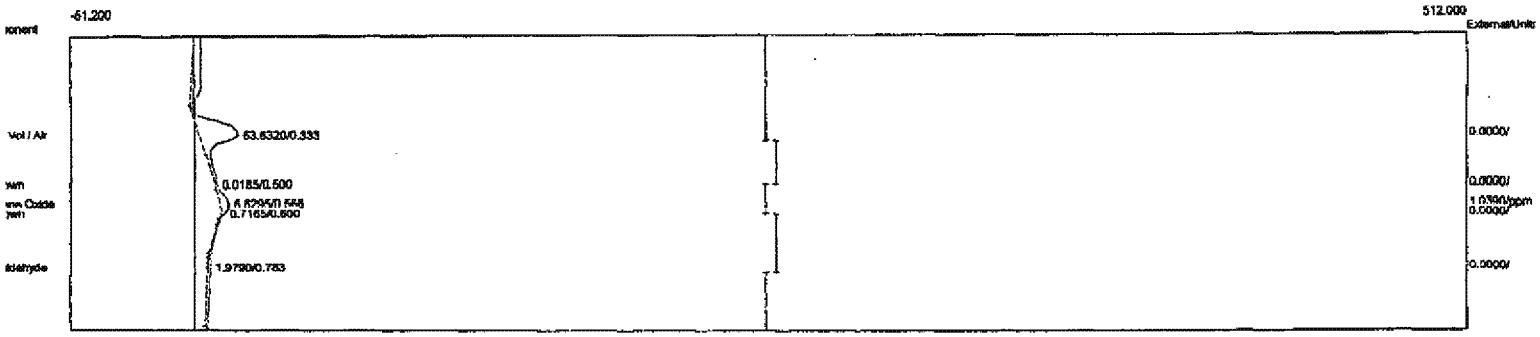
Run#3 Chromatograms

Client: Sterigenics - Willowbrook 1
Client ID: Run#3Exh
nalysis date: 12/12/2016 15:41:52
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-3E01.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



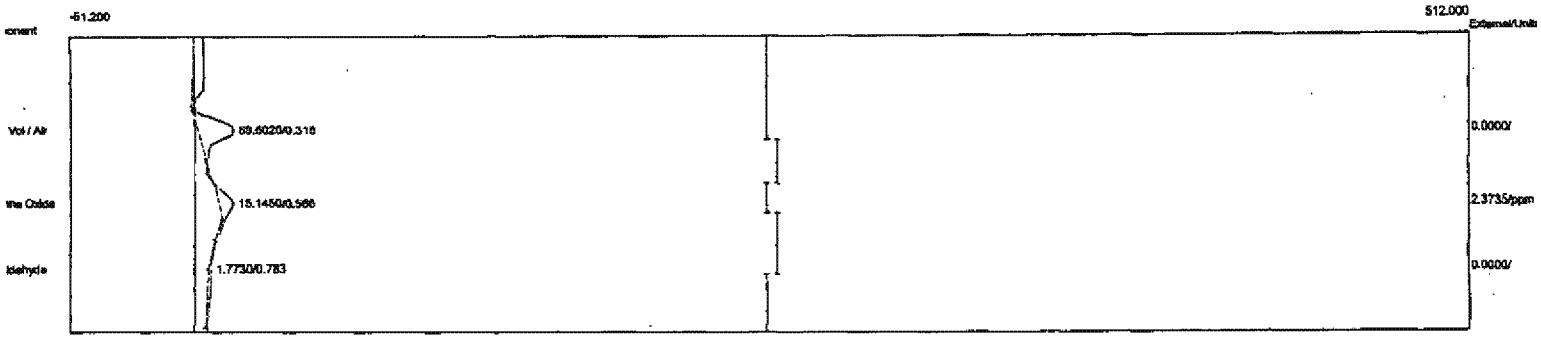
Component	Retention	Area	External	Units
ad Vol / Air	0.333	68.2090	0.0000	
ylene Oxide	0.566	12.1525	1.9045	ppm
etaldehyde	0.783	1.8760	0.0000	
		82.2375	1.9045	

Client: Sterigenics - Willowbrook 1
Client ID: Run#3Exh
ıalysis date: 12/12/2016 15:43:18
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-3E02.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



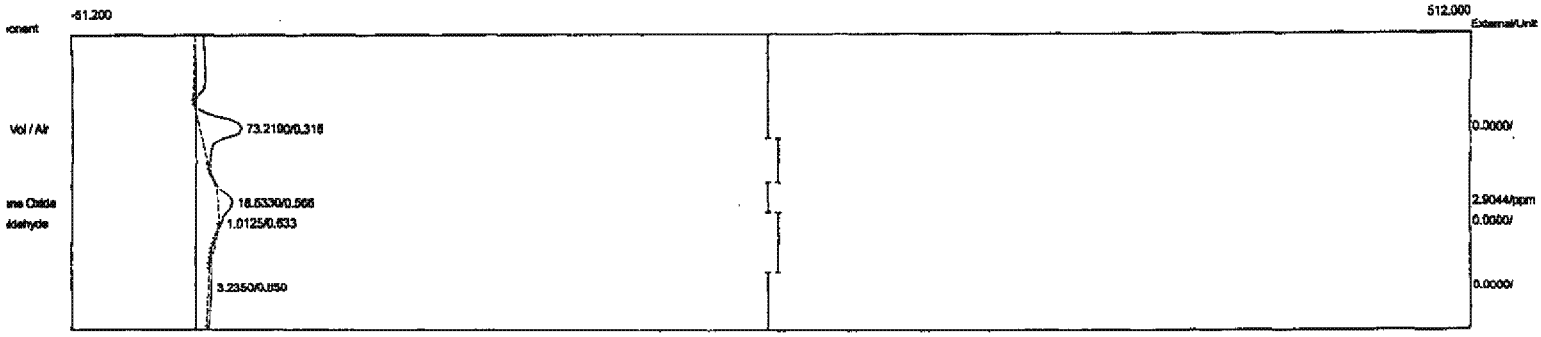
Component	Retention	Area	External	Units
ad Vol / Air	0.333	63.8320	0.0000	
ıylene Oxide	0.566	6.6295	1.0390	ppm
ɜtaldehyde	0.783	1.9790	0.0000	
		72.4405	1.0390	

Client: Sterigenics - Willowbrook 1
Client ID: Run#3Exh
ıalysis date: 12/12/2016 15:44:38
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-3E03.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



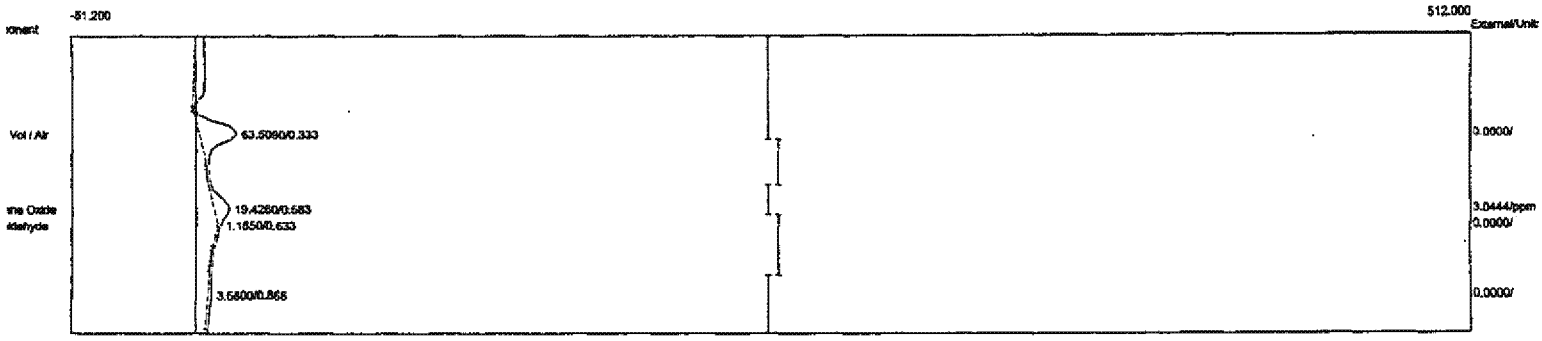
Component	Retention	Area	External	Units
ad Vol / Air	0.316	59.6020	0.0000	
ıylene Oxide	0.566	15.1450	2.3735	ppm
ɜtaldehyde	0.783	1.7730	0.0000	
		76.5200	2.3735	

Client: Sterigenics - Willowbrook 1
Client ID: Run#3Exh
ıalysis date: 12/12/2016 15:45:59
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-3E04.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



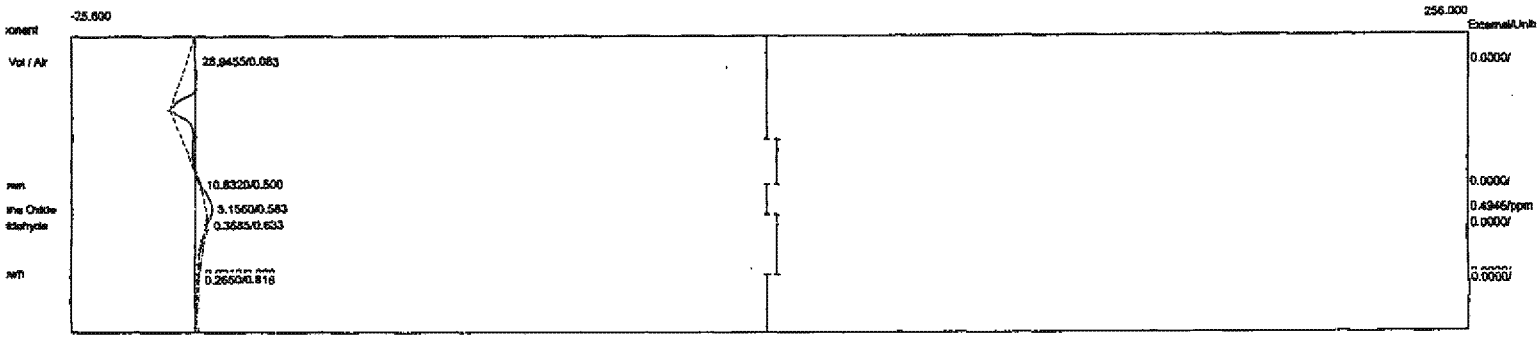
Component	Retention	Area	External	Units
ad Vol / Air	0.316	73.2190	0.0000	
ıylene Oxide	0.566	18.5330	2.9044	ppm
etaldehyde	0.633	1.0125	0.0000	
ı2	0.850	3.2350	0.0000	
		95.9995	2.9044	

Client: Sterigenics - Willowbrook 1
Client ID: Run#3Exh
nalysis date: 12/12/2016 15:47:19
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-3E05.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



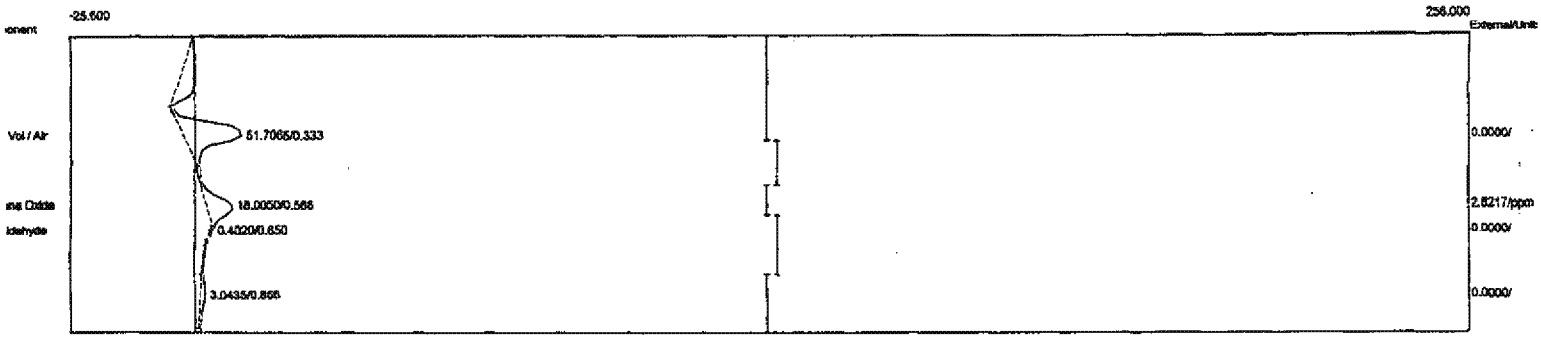
Component	Retention	Area	External	Units
ad Vol / Air	0.333	63.5090	0.0000	
ylene Oxide	0.583	19.4260	3.0444	ppm
etaldehyde	0.633	1.1650	0.0000	
2	0.866	3.6800	0.0000	
		87.7800	3.0444	

Client: Sterigenics - Willowbrook 1
Client ID: Run#3Exh
nalysis date: 12/12/2016 15:48:41
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-3E06.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.083	28.9455	0.0000	
ıylene Oxide	0.583	3.1560	0.4946	ppm
etaldehyde	0.633	0.3685	0.0000	
ı2	0.816	0.2650	0.0000	
		32.7350	0.4946	

Client: Sterigenics - Willowbrook 1
Client ID: Run#3Exh
nalysis date: 12/12/2016 15:50:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-3E07.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.333	51.7065	0.0000	
ylene Oxide	0.566	18.0050	2.8217	ppm
etaldehyde	0.650	0.4020	0.0000	
2	0.866	3.0435	0.0000	
		73.1570	2.8217	

APPENDIX E

Field Data and Calculation Worksheets

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Run #1 - Chamber 2 (DEOXX Scrubber Outlet)
Sterigenics, Inc. - Willowbrook 1
December 12, 2016

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.01	0.1000	42.5	0.01
0.015	0.1225	39.7	0.01
0.015	0.1225	37.5	0.01
0.01	0.1000	41.2	0.01
0.0075	0.0866	35.9	0.01
0.0075	0.0866	37.1	0.16
0.005	0.0707	33.3	0.21
0.005	0.0707	36.4	0.01
0.005	0.0707	34.7	0.68
0.005	0.0707	35.3	0.01
0.0025	0.0500	36.6	0.06
0.0025	0.0500	34.4	1.33
0.0025	0.0500	35.7	0.01
0.0025	0.0500	33.1	1.71
Average =			
0.0068	0.0824	36.7	**0.3021**
	=	497	degR

1-%H2O =	0.97	
mw =	28.54	
stack ID =	6	in.
stack area =	0.196	sq. in.
press =	29.20	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	5.4	ft/sec
Flow =	**63.8**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0000022**	**lbs/min**
evac start =	1431	
evac stop =	1450	
min/cycle =	19	
EtO Emissions =	**0.0000419**	**lbs/cycle**

INLET CALCULATION:

Pre-Evac:				Post-Evac:			
	V =	1350	ft3		V =	1350	ft3
	P =	14.6	in Hg Abs		P =	3.0	in Hg Abs
	T =	125	degF		T =	125	degF
	R =	10.73			R =	10.73	
	mw =	44.05			mw =	44.05	
	lbs EtO @ 100% =	67.80	lbs		lbs EtO @ 100% =	13.93	lbs

Initial EtO = Scale Wt. =	59.6	lbs
% EtO @ Chamber = Scale Wt. / lbs EtO @ 100% (Pre) =	87.9	%
Final EtO = % EtO @ Chamber X lbs EtO @ 100% (Post) =	12.2	lbs
INLET ETO = Initial EtO - Final EtO =	**47.4**	**lbs**
CONTROL EFFICIENCY =	**99.999912**	**%**

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Run #2 - Chamber 8 (DEOXX Scrubber Outlet)
Sterigenics, Inc. - Willowbrook 1
December 12, 2016

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.01	0.1000	36.1	1.73
0.015	0.1225	37.3	1.46
0.01	0.1000	36.1	0.66
0.01	0.1000	35.2	0.08
0.0075	0.0866	35.9	1.83
0.0075	0.0866	32.9	0.01
0.005	0.0707	34.5	2.92
0.005	0.0707	33.4	0.27
0.005	0.0707	31.7	0.01
0.005	0.0707	34.5	3.78
0.0025	0.0500	31.0	0.12
0.0025	0.0500	32.2	3.03
Average =			
0.0071	0.0842	34.2	**1.325**
	=	494	degR

1-%H2O =	0.97	
mw =	28.54	
stack ID =	6	in.
stack area =	0.196	sq. in.
press =	29.20	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	5.5	ft/sec
Flow =	**65.4**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0000099**	**lbs/min**
evac start =	1500	
evac stop =	1517	
min/cycle =	17	
EtO Emissions =	**0.0001683**	**lbs/cycle**

INLET CALCULATION:

Pre-Evac:				Post-Evac:			
	V =	1456	ft3		V =	1456	ft3
	P =	14.4	in Hg Abs		P =	3.0	in Hg Abs
	T =	125	degF		T =	125	degF
	R =	10.73			R =	10.73	
	mw =	44.05			mw =	44.05	
	lbs EtO @ 100% =	72.12	lbs		lbs EtO @ 100% =	15.03	lbs

Initial EtO = Scale Wt. =	64.2	lbs
% EtO @ Chamber = Scale Wt. / lbs EtO @ 100% (Pre) =	89.0	%
Final EtO = % EtO @ Chamber X lbs EtO @ 100% (Post) =	13.4	lbs
INLET ETO = Initial EtO - Final EtO =	**50.8**	**lbs**
CONTROL EFFICIENCY =	**99.999669**	**%**

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Run #3 - Chamber 3 (DEOXX Scrubber Outlet)
Sterigenics, Inc. - Willowbrook 1
December 12, 2016

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.01	0.1000	47.7	1.90
0.015	0.1225	47.3	1.04
0.01	0.1000	46.6	2.37
0.0075	0.0866	47.3	2.90
0.005	0.0707	48.0	3.04
0.005	0.0707	46.8	0.49
0.0025	0.0500	49.2	2.82
Average =			
0.0079	0.0886	47.6	**2.080**
	=	508	degR

1-%H2O =	0.97	
mw =	28.54	
stack ID =	6	in.
stack area =	0.196	sq. in.
press =	29.20	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	5.9	ft/sec
Flow =	**67.9**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0000162**	**lbs/min**
evac start =	1540	
evac stop =	1551	
min/cycle =	11	
EtO Emissions =	**0.0001777**	**lbs/cycle**

INLET CALCULATION:

Pre-Evac:				Post-Evac:			
	V =	663	ft3		V =	663	ft3
	P =	14.1	in Hg Abs		P =	3.0	in Hg Abs
	T =	125	degF		T =	125	degF
	R =	10.73			R =	10.73	
	mw =	44.05			mw =	44.05	
	lbs EtO @ 100% =	32.16	lbs		lbs EtO @ 100% =	6.84	lbs

Initial EtO = Scale Wt. =	30.1	lbs
% EtO @ Chamber = Scale Wt. / lbs EtO @ 100% (Pre) =	93.6	%
Final EtO = % EtO @ Chamber X lbs EtO @ 100% (Post) =	6.4	lbs
INLET ETO = Initial EtO - Final EtO =	**23.7**	**lbs**
CONTROL EFFICIENCY =	**99.999250**	**%**

APPENDIX F

Gas Certifications

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

600 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-001
Item No.: 02020001310TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CAL4448
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	1.10	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: MT DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	1.	PPM	1.10	PPM	10.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1300 PSIG
Expiration Date: 18Apr2018

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases
00 CAJON BLVD., SAN BERNARDINO, CA 92411
Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-003
Item No.: 02020001320TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM003232
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	10.1	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: MT
MT

DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	10.	PPM	10.1	PPM	1.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1400 PSIG
Expiration Date: 18Apr2018

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

500 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-004
Item No.: 02020001330TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM011385
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	100.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully BLM

DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	100.	PPM	100.	PPM	.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1400 PSIG
Expiration Date: 18Apr2018

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

300 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-005
Item No.: 02020001340TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM002810
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	1,000.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully BLM DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	1,000.	PPM	1,000.	PPM	.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1300 PSIG
Expiration Date: 18Apr2018

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

00 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-006
Item No.: 02020001340TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM005787
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	10,080.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully
BLM

DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	10,000.	PPM	10,080.	PPM	.8	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 800 PSIG
Expiration Date: 18Apr2018

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFICATE OF ANALYSIS

Customer Name:	ECSi, Inc.	**Cylinder Number:**	SA25925
Stock or Analyzer Tag Number:	N/A	**Product Class:**	Certified Standard
Customer Reference:	Verbal- Dan	**Cylinder - Contents[1]:**	28 CF @ 2000 PSI
MESA Reference:	104448	**Cylinder-CGA:**	A006-HP-BR/350
Date of Certification:	4/20/2016	**Analysis Method:**	GC-TCD/FID
Recommended Shelf Life:	2 Years	**Preparation Method:**	Gravimetric

Component	Requested Concentration[2]	Reported Concentration[2,3]
Ethylene Oxide	50 ppm	48.8 ppm
Nitrogen	Balance	Balance

Authorized Signature:

1. The fill pressure shown on the COA is as originally quoted. The fill pressure measured by the customer may differ from the fill pressure originally quoted due to temperature effects, compressibility of the individual components when blended together in the cylinder, gauge accuracy or reduction in content volume before shipping as a result of samples withdrawn for laboratory QC necessary to ensure product quality.
2. Unless otherwise stated, concentrations are given in molar units.
3. Vapor pressure mixes are blended at a sufficiently low pressure so as to eliminate phase separation under most low temperature conditions encountered during transport or storage. However, it is generally recommended that cylinders containing vapor pressure restricted mixes be placed on the floor in a horizontal position and rolled back and forth to improve homogeneity of the gas phase mixture before being put into service.

Analytical Gas Standards are prepared and analyzed using combinations of NIST traceable weights, SRM's provided by NIST, or internal gas standards that have been verified for accuracy using procedures published by the US-EPA. Pure gases are analyzed and certified for purity using minor component Analytical Gas Standards prepared according to the methods specified above. Balances are calibrated to NIST test weights covered by NIST test number 822/256175/96. Reference Certification #'s: 163/W, 830/N and 3280. Calibration methods are in conformance with MIL-STD 45662A.

MESA Specialty Gases & Equipment
division of MESA International Technologies, Inc.
3619 Pendleton Avenue, Suite C • Santa Ana, California 92704 • USA
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On-line Catalog at www.mesagas.com

APPENDIX G

Process/Parametric Monitoring Data

)I ANTARES KORSCP V3Q-4 12/12/16 Mon 18:34 CYCLE 751 CHECK VALUE 22130
RUN NUMBER 1860427

TIME	PRESS INHGA	TEMP (DEG F) AVG	RH %	VAP GAS	ETO MG/L	H2O MG/L	ALARMS & MESSAGES	ACTION TAKEN
8:34	14.4	126		120	672	16.6		
MAX:	14.4	126		120	672	16.6	PHASE 0:12	PHASE ELAPSED 0:12
MIN:	2.0	125		76	0	2.2		CYCLE 2:20

STERILANT USED THIS PHASE: 59.6, CYCLE TOTAL: 59.6

GAS DWELL (ED) PHASE

8:35	14.4	126		120	686	16.9		
8:35	14.4	126		120	690	17.1		OPERATOR CYCLE STOP
8:35	OPERATOR SENSOR CHECK --			PR	48.8,	RH	117, JWT 130, VLT 82, VGX 120	
	CT1	127,	CT2	124,	CT3	126,	P01 124, P02 82, P03 82, P04 82	
	P05	82,	P06	82,	P07	82,	P08 82, P09 82, P10 82, P11 82	
	P12	82,	P13	82,	P14	82,	P15 82, P16 82, P17 82, P18 82	
	P19	82,	P20	82,	ETO	704,	H2O 17.2, WT 295.1	
8:35	"RC 12DEC2016							
8:36	14.4	126		119	706	17.2		
8:37	14.4	126		118	709	17.2		
8:38	14.4	126		117	711	17.2		
8:39	14.4	126		116	711	17.7		
8:40	14.4	126		116	711	17.5		
8:41	14.4	126		115	712	17.7		
8:42	14.4	126		115	712	17.7		
8:43	14.4	126		114	711	17.7		
8:44	14.4	126		114	711	17.7		
8:45	14.4	125		114	711	18.0		
8:46	14.4	125		113	711	18.1		
8:47	14.4	125		113	711	18.1		
8:48	14.4	125		113	711	18.1		
8:49	14.4	125		112	711	18.3		
8:50	14.4	125		112	711	18.6		
8:50	14.4	125		112	711	18.6	CYCLE STILL STOPPED	
8:51	14.4	125		112	711	18.6		
8:52	14.4	125		112	711	19.1		
8:53	14.4	125		112	711	19.1		
8:54	14.4	125		111	711	19.1		
8:55	14.4	125		111	711	19.1		
8:56	14.4	125		111	711	19.1		
8:57	14.4	125		111	711	19.5		
8:58	14.4	125		111	711	19.7		
8:59	14.4	125		111	711	19.5		
9:00	14.4	125		110	711	19.9		
9:01	14.4	125		110	711	19.9		
9:02	14.4	125		110	711	19.9		
9:03	14.4	125		110	711	19.9		
9:04	14.4	125		110	711	19.9		
9:05	14.4	125		110	711	19.9		
9:05	14.4	125		110	712	19.9	CYCLE STILL STOPPED	
9:06	14.4	125		110	712	20.1		
9:07	14.4	125		110	713	20.4		

)I ANTARES KORSCP V3Q-4 12/12/16 Mon 20:27 CYCLE 751 CHECK VALUE 22130
RUN NUMBER 1860427

TIME	PRESS INHGA	TEMP (DEG F) AVG	RH %	VAP GAS	ETO MG/L	H2O MG/L	ALARMS & MESSAGES	ACTION TAKEN
0:27	14.6	125		107	713	25.9		
0:28	14.6	125		107	713	25.9		
0:29	14.6	125		107	713	25.9		
0:30	14.6	125		107	713	25.9		
0:31	14.6	125		107	713	25.9		
0:32	14.6	125		107	713	25.9		
0:33	14.6	125		107	713	25.9		
0:33	14.6	125		107	713	26.0		OPERATOR CYCLE ABORT
0:33	14.6	125		107	713	26.0	SHORT EXPOSURE	
0:33	14.6	125		107	713	26.0		
MAX:	14.6	126		120	716	26.0	PHASE 0:00	PHASE ELAPSED 1:58
MIN:	14.4	125		107	686	16.9		CYCLE 4:18

AFTER VACUUM PHASE

0:33	14.6	125		107	713	26.2		
0:34	13.6	125		94	699	25.9		
0:35	12.5	125		94	638	24.4		
0:35	12.4	125		94	638	24.4	SLOW EVACUATION	
0:35	OPERATOR SENSOR CHECK --			PR	41.6,	RH	121, JWT 130, VLT 81, VGX 95	
	CT1	126, CT2	123,	CT3	125,	P01	124, P02 81, P03 81, P04 81	
	P05	81, P06	81,	P07	81,	P08	81, P09 81, P10 81, P11 81	
	P12	81, P13	81,	P14	81,	P15	81, P16 81, P17 81, P18 81	
	P19	81, P20	81,	ETO	627,	H2O	24.1, WT 295.2	
0:36	11.5	125		95	589	23.5		
0:37	10.5	125		96	541	22.3		
0:38	9.7	125		96	498	20.7		
0:39	9.0	125		97	458	19.8		
0:40	8.3	125		97	422	18.8		
0:41	7.6	125		98	389	17.7		
0:42	7.1	125		98	358	16.8		
0:43	6.5	125		99	331	15.9		
0:44	6.0	125		100	307	15.0		
0:45	5.6	125		100	283	14.3		
0:46	5.1	125		100	262	13.1		
0:47	4.8	125		101	244	12.7		
0:48	4.4	125		101	226	11.8		
0:49	4.1	125		102	210	11.6		
0:50	3.8	125		102	195	10.9		
0:51	3.5	125		102	179	10.4		
0:52	3.2	125		103	166	9.6		
0:53	3.0	125		103	156	9.3	EVACUATION PRESSURE	
0:53	3.0	125		103	156	9.3		
MAX:	14.6	125		107	713	26.2	PHASE 0:19	PHASE ELAPSED 0:19
MIN:	3.0	125		94	156	9.3		CYCLE 4:38

STERIGENICS
7775 S QUINCY STREET
WILLOWBROOK, IL 60527
1-630-654-5151
CHAMBER NO. 8

Jc 12DEC16

DATE 12/12/16 Mon
PROG VERSION KORSCP V3Q-4
IN NUMBER 1852745

CYCLE 751

12DEC16

STERILANT EO
CHECK VALUE 22130
OPERATOR R CASTELLANO

ISTOMER MAINTENANCE
IT NO. ENG #2 30NOV2016
IANTITY NA
ODUCT NA

IRRENT TANK: LOT # E002374UTLX902993L16, TARE 283.0 LB
ALE WEIGHT 433.4 LB, STERILANT LEFT 145.4 LB

PROCESS PARAMETERS

CHAMBER TEMP 125 F, COOL AT 135 F, BLOWER IS USED, ALARM REPETITION 15:00 MM:SS
VACUUM A 2.0 INHGA, 2.01 INHG/MIN, REQD 3.0 INHGA
LEAK TEST 0:05 HH:MM, TOLERANCE 0.2 INHG
NITROGEN DILUTION 2 CYCLES; NITROGEN: 24.0 INHGA, 1.51 INHG/MIN
EVAC: 2.0 INHGA, 2.01 INHG/MIN
GAS A 1 CYCLES; INJ: 14.4 INHGA, 1.00 INHG/MIN, EO
GAS DWELL 14.4 INHGA, -0.2 INHG, DWELL 1:00 HH:MM
AFTER VACUUM 3.0 INHGA OR 0:45 HH:MM, 2.01 INHG/MIN, REQD 3.5 INHGA
GAS WASH A 3 CYCLES RLS: 23.0 INHGA, 1.51 INHG/MIN, NITR
VAC: 3.0 INHGA OR 0:45 HH:MM, 2.01 INHG/MIN
REQD 3.5 INHGA
GAS WASH B 1 CYCLES RLS: 23.0 INHGA, 1.51 INHG/MIN, AIR
VAC: 3.0 INHGA OR 0:45 HH:MM, 2.01 INHG/MIN
REQD 3.5 INHGA
RELEASE 28.0 INHGA, 1.51 INHG/MIN

TIME	PRESS INHGA	TEMP (DEG F) AVG	RH %	VAP ETO GAS MG/L	H2O MG/L	ALARMS & MESSAGES	ACTION TAKEN
7:13	OPERATOR SENSOR CHECK -- PR 100.1, RH 0, JWT 128, VLT 85, VGX 108						
	CT1 125, CT2 127, CT3 124, P01 127, P02 85, P03 85, P04 85						
	P05 85, P06 85, P07 85, P08 85, P09 85, P10 85, P11 85						
	P12 85, P13 85, P14 85, P15 85, P16 85, P17 85, P18 85						
	P19 85, P20 85, ETO 0, H2O 7.0, WT 433.3						
	VACUUM A PHASE						
7:15	29.4	125		107	0	5.7	
7:15	OPERATOR SENSOR CHECK -- PR 99.4, RH 0, JWT 127, VLT 85, VGX 107						
	CT1 124, CT2 127, CT3 123, P01 127, P02 85, P03 85, P04 85						
	P05 85, P06 85, P07 85, P08 85, P09 85, P10 85, P11 85						
	P12 85, P13 85, P14 85, P15 85, P16 85, P17 85, P18 85						
	P19 85, P20 85, ETO 0, H2O 5.6, WT 433.4						
7:16	27.3	125		107	0	5.4	
7:17	25.3	125		107	0	5.1	
7:18	23.2	124		107	0	4.7	
7:19	21.2	124		107	0	4.2	

)I ANTARES KORSCP V3Q-4 12/12/16 Mon 19:02 CYCLE 751 CHECK VALUE 22130
JN NUMBER 1852745

TIME	PRESS INHGA	TEMP (DEG F) AVG	RH %	VAP GAS	ETO MG/L	H2O MG/L	ALARMS & MESSAGES	ACTION TAKEN
19:02	3.2	129		89	3	0.1		
19:03	4.2	129		75	69	0.1		
19:04	5.2	129		80	140	2.1		
19:05	6.2	129		90	206	3.3		
19:06	7.2	129		99	260	4.2		
19:07	OPERATOR SENSOR CHECK --			PR	27.1,	RH	0, JWT 139, VLT 85, VGX 96	
	CT1 129, CT2 130, CT3 129, P01 130, P02 85, P03 85, P04 85							
	P05 85, P06 85, P07 85, P08 85, P09 85, P10 85, P11 85							
	P12 85, P13 85, P14 85, P15 85, P16 85, P17 85, P18 85							
	P19 85, P20 85, ETO 294, H2O 4.8, WT 401.9							
19:07	8.2	129		104	320	5.3		
19:08	9.2	129		110	381	6.6		
19:09	10.2	129		113	440	7.6		
19:10	11.2	129		116	495	8.3		
19:11	12.2	129		117	557	9.2		
19:12	13.2	129		118	618	10.1		
19:13	14.2	129		118	673	10.6		
19:13	14.4	129		118	698	10.7		
MAX:	14.4	129		118	698	10.7	PHASE 0:12	PHASE ELAPSED 0:12
MIN:	2.0	128		75	0	0.1		CYCLE 1:58

STERILANT USED THIS PHASE: 64.2, CYCLE TOTAL: 64.2

GAS DWELL (EO) PHASE

19:13	14.5	129		118	706	10.9		
19:14	14.5	129		117	727	11.1		
19:15	14.5	129		117	729	11.1		OPERATOR CYCLE STOP
19:15	OPERATOR SENSOR CHECK --			PR	49.0,	RH	0, JWT 137, VLT 85, VGX 117	
	CT1 128, CT2 130, CT3 129, P01 130, P02 85, P03 85, P04 85							
	P05 85, P06 85, P07 85, P08 85, P09 85, P10 85, P11 85							
	P12 85, P13 85, P14 85, P15 85, P16 85, P17 85, P18 85							
	P19 85, P20 85, ETO 729, H2O 11.1, WT 369.0							
19:15	"RC 12DEC2016							
19:15	14.5	129		117	729	11.5		
19:16	14.5	129		116	732	11.5		
19:17	14.4	129		116	734	11.5		
19:18	14.4	129		115	734	11.5		
19:19	14.4	129		115	734	11.5		
19:20	14.4	129		114	734	11.5		
19:21	14.4	129		114	734	11.3		
19:22	14.4	129		113	734	11.5		
19:23	14.4	129		113	734	11.5		
19:24	14.4	129		113	734	11.5		
19:25	14.4	129		112	734	11.5		
19:26	14.4	128		112	734	11.5		
19:27	14.4	128		112	734	11.5		
19:28	14.4	128		111	734	11.5		
19:29	14.4	128		111	734	11.5		
19:30	14.4	128		111	734	11.5	CYCLE STILL STOPPED	

)I ANTARES KORSCP V3Q-4 12/12/16 Mon 20:49 CYCLE 751 CHECK VALUE 22130
JN NUMBER 1852745

TIME	PRESS INHGA	TEMP (DEG F) AVG	RH %	VAP GAS	ETO MG/L	H2O MG/L	ALARMS & MESSAGES	ACTION TAKEN
20:49	14.4	125		104	729	12.0		
20:50	14.4	125		104	729	12.0		
20:51	14.4	125		104	731	12.4		
20:52	14.4	125		104	729	12.4		
20:53	14.4	125		104	731	12.0		
20:54	14.4	125		104	732	12.0		
20:55	14.4	125		104	732	12.1		
20:56	14.4	125		104	732	12.3		
20:57	14.4	125		104	732	12.4		
20:58	14.4	125		104	732	12.4		
20:59	14.4	125		104	732	12.0		
21:00	14.4	125		104	732	12.0	CYCLE STILL STOPPED	
21:00	14.4	125		104	732	12.3		
21:01	14.4	125		104	732	12.3		OPERATOR CYCLE ABORT
21:01	14.4	125		104	732	12.3	SHORT EXPOSURE	
21:01	14.4	125		104	732	12.3		
MAX:	14.5	129		118	734	12.4	PHASE 0:01	PHASE ELAPSED 1:47
MIN:	14.4	125		104	706	10.9		CYCLE 3:46

AFTER VACUUM PHASE

21:01	14.4	125		104	732	12.3		
21:02	13.2	125		98	713	12.0		
21:03	12.0	125		98	643	10.8		
21:03	11.8	125		98	637	10.6	SLOW EVACUATION	
21:04	10.8	125		98	584	10.3		
21:05	9.8	125		98	528	9.7		
21:06	8.9	125		98	484	9.2		
21:07	8.1	125		98	439	8.3		
21:08	7.4	125		98	399	7.9		
21:09	6.7	125		98	362	6.8		
21:10	6.1	125		98	328	6.0		
21:11	5.5	125		98	300	5.6		
21:12	5.0	125		98	273	5.4		
21:13	4.5	125		99	250	4.2		
21:14	4.1	125		99	229	4.2		
21:15	3.8	125		99	210	3.8		
21:16	3.5	125		99	193	3.5		
21:17	3.2	125		100	176	3.2		
21:18	3.0	125		100	167	3.2	EVACUATION PRESSURE	
21:18	3.0	125		100	167	3.2		
MAX:	14.4	125		104	732	12.3	PHASE 0:16	PHASE ELAPSED 0:16
MIN:	3.0	125		98	167	3.2		CYCLE 4:02

GAS WASH A PHASE

21:18	3.0	125		100	167	3.2	========= RELEASE 1 ==========	
21:19	4.6	125		90	195	3.3		

STERIGENICS
7775 QUINCY STREET
WILLOWBROOK, IL 60527
1-630-654-5151
CHAMBER NO. 3

JO 12 DEC16

X 12DEC16

DATE 12/12/16 Mon
PROG VERSION KORSCP V30-4
RUN NUMBER 1860454

CYCLE 751

STERILANT EO
CHECK VALUE 22130
OPERATOR R CASTELLANO

CUSTOMER MAINTENANCE
LOT NO. ENG #7-12DEC2017
QUANTITY NA
PRODUCT NA

RRENT TANK: LOT # E002916UTLX902993L16, TARE 278.0 LB
ALE WEIGHT 525.2 LB, STERILANT LEFT 242.2 LB

PROCESS PARAMETERS

CHAMBER TEMP 125 F, COOL AT 135 F, BLOWER IS USED, ALARM REPETITION 15:00 MM:SS
VACUUM A 2.0 INHGA, 2.01 INHG/MIN, REQD 3.0 INHGA
LEAK TEST 0:05 HH:MM, TOLERANCE 0.2 INHG
NITROGEN DILUTION 2 CYCLES; NITROGEN: 24.0 INHGA, 1.51 INHG/MIN
EVAC: 2.0 INHGA, 2.01 INHG/MIN
GAS A 1 CYCLES; INJ: 14.4 INHGA, 1.00 INHG/MIN, EO
GAS DWELL 14.4 INHGA, -0.2 INHG, DWELL 1:00 HH:MM
AFTER VACUUM 3.0 INHGA OR 0:45 HH:MM, 2.01 INHG/MIN, REQD 3.5 INHGA
GAS WASH A 3 CYCLES RLS: 23.0 INHGA, 1.51 INHG/MIN, NITR
VAC: 3.0 INHGA OR 0:45 HH:MM, 2.01 INHG/MIN
REQD 3.5 INHGA
GAS WASH B 1 CYCLES RLS: 23.0 INHGA, 1.51 INHG/MIN, AIR
VAC: 3.0 INHGA OR 0:45 HH:MM, 2.01 INHG/MIN
REQD 3.5 INHGA
RELEASE 28.0 INHGA, 1.51 INHG/MIN

TIME	PRESS INHGA	TEMP (DEG F) AVG	RH %	VAP GAS	ALARMS & MESSAGES	ACTION TAKEN
9:04	OPERATOR SENSOR CHECK --			PR 99.6,	RH 0,	JWT 128, VLT 80, VGX 116
	CT1 125,	CT2 128,		CT3 125,	P01 128,	P02 80, P03 80, P04 80
	P05 80,	P06 80,		P07 80,	P08 80,	P09 80, P10 80, P11 80
	P12 80,	P13 80,		P14 80,	P15 80,	P16 80, P17 80, P18 80
	P19 80,	P20 80,		ETO 0,	H2O 0.1,	WT 525.2
				VACUUM A PHASE		
9:05	29.4	126		116		
9:05	OPERATOR SENSOR CHECK --			PR 99.5,	RH 0,	JWT 132, VLT 80, VGX 116
	CT1 125,	CT2 128,		CT3 125,	P01 127,	P02 80, P03 80, P04 80
	P05 80,	P06 80,		P07 80,	P08 80,	P09 80, P10 80, P11 80
	P12 80,	P13 80,		P14 80,	P15 80,	P16 80, P17 80, P18 80
	P19 80,	P20 80,		ETO 0,	H2O 0.1,	WT 525.2
9:06	27.3	126		116		
9:07	25.4	126		115		
9:08	23.4	126		114		
9:09	21.4	125		114		

I ANTARES KORSOP V3Q-4 12/12/16 Mon 20:39 CYCLE 751 CHECK VALUE 22130
RUN NUMBER 1660454

TIME	PRESS INHGA	TEMP (DEG F) AVG	RH %	VAP GAS	ALARMS & MESSAGES	ACTION TAKEN
0:39	OPERATOR SENSOR CHECK --			PR 24.0,	RH 0, JWT 132, VLT 79, VGX 51	
	CT1 123, CT2 129, CT3 123, P01 129, P02 79, P03 79, P04 79					
	P05 79, P06 79, P07 79, P08 79, P09 79, P10 79, P11 79					
	P12 79, P13 79, P14 79, P15 79, P16 79, P17 79, P18 79					
	P19 79, P20 79, ETO 0, H2O 0.1, WT 512.6					
0:40	7.1	125		51		
0:40	OPERATOR SENSOR CHECK --			PR 24.0,	RH 0, JWT 131, VLT 79, VGX 53	
	CT1 123, CT2 129, CT3 123, P01 129, P02 79, P03 79, P04 79					
	P05 79, P06 79, P07 79, P08 79, P09 79, P10 79, P11 79					
	P12 79, P13 79, P14 79, P15 79, P16 79, P17 79, P18 79					
	P19 79, P20 79, ETO 0, H2O 0.1, WT 512.6					
0:41	7.1	125		55		
0:41	OPERATOR SENSOR CHECK --			PR 23.9,	RH 0, JWT 131, VLT 79, VGX 56	
	CT1 123, CT2 129, CT3 123, P01 129, P02 79, P03 79, P04 79					
	P05 79, P06 79, P07 79, P08 79, P09 79, P10 79, P11 79					
	P12 79, P13 79, P14 79, P15 79, P16 79, P17 79, P18 79					
	P19 79, P20 79, ETO 0, H2O 0.1, WT 512.6					
0:42	7.1	125		56		
0:42	OPERATOR SENSOR CHECK --			PR 23.9,	RH 0, JWT 131, VLT 79, VGX 58	
	CT1 123, CT2 129, CT3 123, P01 129, P02 79, P03 79, P04 79					
	P05 79, P06 79, P07 79, P08 79, P09 79, P10 79, P11 79					
	P12 79, P13 79, P14 79, P15 79, P16 79, P17 79, P18 79					
	P19 79, P20 79, ETO 0, H2O 0.1, WT 512.6					
0:43	7.1	125		62		
0:43	OPERATOR SENSOR CHECK --			PR 23.9,	RH 0, JWT 132, VLT 79, VGX 63	
	CT1 123, CT2 129, CT3 123, P01 129, P02 79, P03 79, P04 79					
	P05 79, P06 79, P07 79, P08 79, P09 79, P10 79, P11 79					
	P12 79, P13 79, P14 79, P15 79, P16 79, P17 79, P18 79					
	P19 79, P20 79, ETO 0, H2O 0.1, WT 512.6					
0:43	7.1	125		63		CYCLE CONTINUED
0:44	8.2	125		71		
0:45	9.2	125		72		
0:46	10.2	125		78		
0:47	11.2	125		82		
0:48	12.2	125		87		
0:49	13.2	125		92		
0:50	14.2	125		96		
0:50	14.4	125		98		
MAX:	14.4	125		109	PHASE 0:11	PHASE ELAPSED 0:18
MIN:	2.0	125		50		CYCLE 1:45

STERILANT USED THIS PHASE: 30.1, CYCLE TOTAL: 30.1

GAS DWELL (EO) PHASE

0:50	14.5	125	98	
0:50	14.5	125	99	OPERATOR CYCLE STOP
0:51	14.5	125	99	
0:52	14.4	125	100	
0:53	14.4	125	101	

I ANTARES KORSCP V3Q-4 12/12/16 Mon 21:42 CYCLE 751 CHECK VALUE 22130
RUN NUMBER 1860454

TIME	PRESS INHGA	TEMP (DEG F) AVG	RH %	VAP GAS	ALARMS & MESSAGES	ACTION TAKEN
1:42	14.1	125		112		
MAX:	14.5	126		112	PHASE 0:00	PHASE ELAPSED 0:51
MIN:	14.1	125		98		CYCLE 2:37

AFTER VACUUM PHASE

1:42	14.1	125		112	
1:43	12.2	125		103	
1:44	10.4	125		103	
1:44	10.3	125		103	SLOW EVACUATION
1:45	8.9	125		104	
1:46	7.6	125		105	
1:47	6.5	125		105	
1:48	5.6	125		106	
1:49	4.8	125		106	
1:50	4.3	125		107	
1:51	3.6	125		107	
1:52	3.3	125		107	
1:53	3.0	125		107	EVACUATION PRESSURE
1:53	3.0	125		107	
MAX:	14.1	125		112	PHASE 0:10 PHASE ELAPSED 0:10
MIN:	3.0	125		103	CYCLE 2:47

GAS WASH A PHASE

1:53	3.0	125		107	========== RELEASE 1 ==========
1:54	4.6	125		89	
1:55	6.1	125		85	
1:56	7.6	125		83	
1:57	9.1	125		82	
1:58	10.6	125		83	
1:59	12.1	125		84	
2:00	13.6	125		85	
2:01	15.1	125		85	
2:02	16.6	125		86	
2:03	18.1	125		87	
2:04	19.6	125		87	
2:05	21.1	125		88	
2:06	22.6	125		88	
2:06	23.0	125		89	========== EVACUATION 1 ==========
2:07	20.9	125		90	
2:08	19.0	125		93	
2:08	OPERATOR SENSOR CHECK --		PR	50.3,	RH 0, JWT 129, VLT 79, VGX 94
	CT1 124,	CT2 128,	CT3	123,	P01 126, P02 79, P03 79, P04 79
	P05 79,	P06 79,	P07	79,	P08 79, P09 79, P10 79, P11 79
	P12 79,	P13 79,	P14	79,	P15 79, P16 79, P17 79, P18 79
	P19 79,	P20 79,	ETO	0,	H2O 0.1, WT 494.7
2:09	16.9	125		95	

REPORT OF
AIR POLLUTION SOURCE TESTING
OF AN ETHYLENE OXIDE EMISSION-CONTROL SYSTEM
OPERATED BY STERIGENICS, INC.
IN WILLOWBROOK, ILLINOIS
ON DECEMBER 13, 2016

Submitted to:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 North Grand Avenue East
Springfield, Illinois 62794

Submitted by:

STERIGENICS US, LLC.
2015 Spring Road
Oak Brook, Illinois 60523

I.D. Number 043110AAC

Prepared by:

ECSI, INC.
PO Box 848
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January 20, 2017

ECSi

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TEST DATE

Tuesday, December 13, 2016

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ECSi

1.0 INTRODUCTION

On Tuesday, December 13, 2016, ECSi, Inc. performed air pollution source testing of an ethylene oxide (EtO) emission-control device operated by Sterigenics, Inc. in Willowbrook, Illinois. The control device tested was a two-stage Advanced Air Technologies (AAT) Safe Cell emission-control system, comprised of a packed-tower chemical scrubber (SC1) and a dry-bed reactor (SC2), used to control emissions from two aeration rooms and from four sterilizer vacuum pumps. The purpose of the testing program was to demonstrate continued compliance with the conditions established in the Air Quality Permit granted to Sterigenics by the Illinois Environmental Protection Agency (IEPA).

2.0 EQUIPMENT

The EtO gas-sterilization system is comprised of four commercial sterilizers, which are discharged through liquid-ring vacuum pumps to a two-stage Advanced Air Technologies (AAT) Safe Cell emission-control system. The gas-sterilization and emission-control equipment consist of the following:

- Four Gas Sterilizers, each comprised of a steam-heated sterilization chamber, a recirculating vacuum pump chamber evacuation system, a backvent valve, and a fugitive emissions exhaust hood;

- Two aeration rooms, each comprised of a heated aeration chamber and a chamber exhaust system.

Exhaust and aeration emissions are be controlled by:

- One two-stage Advanced Air Technologies Safe Cell emission-control system, comprised of a packed-tower chemical scrubber (SC1), equipped with a packed reaction/interface column, a scrubber fluid recirculation system, and a scrubber fluid reaction/storage tank, and a dry bed reactor/scrubber (SC2), comprised of a bank of solid-bed reaction vessels, connected in parallel, installed downstream of SC1 and upstream of a dedicated blower exhaust system.

3.0 TESTING

EtO source testing was conducted in accordance with the procedures outlined in USEPA CFR40, Part 63.365. EtO emissions monitoring was conducted simultaneously at the inlet and outlet of the AAT System during the first chamber evacuation of the sterilizer exhaust phase of one of the three sterilizers, and during a one-hour time interval of the aeration process. A total of three exhaust-phase test runs, and three aeration test runs were performed.

Exhaust phase testing with one sterilizer discharging to the scrubber at a time represents worst-case conditions for demonstration of control efficiency compliance. At this lower inlet loading, the scrubber must perform at its maximum efficiency to achieve outlet EtO concentrations low enough to demonstrate compliance.

During the first chamber evacuation of the exhaust phase, EtO emissions to the inlet of the AAT System were determined using the Ideal Gas Law and the chamber conditions at the beginning and at the end of the first chamber evacuation. During the first chamber evacuation of the exhaust phase, EtO emissions from the outlet of the AAT System were determined using direct source sample injection into the GC. During aeration testing, EtO emissions at the inlet and the outlet of the Safe Cell System were determined using direct source sample injection into a GC.

All exhaust phase testing was conducted during normal process load conditions, but with an empty sterilization chamber to facilitate the performance of multiple test runs. All aeration testing was performed during normal process load conditions, after freshly sterilized product had been transferred into an aeration chamber/room. The testing program was conducted in accordance with the procedures outlined in the following sections.

4.0 RULE/COMPLIANCE REQUIREMENTS

The EtO gas-sterilization system at the Willowbrook II facility was tested to demonstrate compliance with EPA requirements, as specified in the IEPA Air Quality Permit. The following requirements must be met:

- The sterilizer exhaust phase (post exposure vacuum pulses) emissions must be vented to control equipment with an EtO emission-reduction efficiency of at least 99 % by weight.

- The emissions from the aeration process must be discharged to control equipment with an EtO emission-reduction efficiency of at least 99.0% by weight or by a maximum concentration of 1 ppmv, whichever is less stringent..

Testing is required to demonstrate compliance with these requirements. Source testing of the AAT Safe Cell System is required initially, and may be required periodically thereafter.

5.0 TEST METHOD REFERENCE

5.1 INTRODUCTION

EtO source testing was performed in accordance with the procedures outlined in USEPA CFR40, Part 63.365. EtO emissions monitoring was conducted simultaneously at the inlet and outlet of the AAT System during the first chamber evacuation of the sterilizer exhaust phase of one of the three sterilizers. A total of three exhaust-phase test runs were performed.

Exhaust phase testing with one sterilizer discharging to the scrubber at a time represents worst-case conditions for demonstration of control efficiency compliance. At this lower inlet loading, the scrubber must perform at its maximum efficiency to achieve outlet EtO concentrations low enough to demonstrate compliance.

During the first chamber evacuation of the exhaust phase, EtO emissions to the inlet of the AAT System were determined using the Ideal Gas Law and the chamber conditions at the beginning and at the end of the first chamber evacuation. During the first chamber evacuation of the exhaust phase, EtO emissions from the outlet of the AAT System were determined using direct source sample injection into the GC. During aeration testing, EtO emissions at the inlet and the outlet of the Safe Cell System were determined using direct source sample injection into a GC.

All exhaust phase testing was conducted during normal process load conditions, but with an empty sterilization chamber to facilitate the performance of multiple test runs. All aeration testing was performed during normal process load conditions, after freshly sterilized product had been transferred into an aeration chamber/room. The testing program was conducted in accordance with the procedures outlined in the following sections.

Operation and documentation of process conditions was performed by personnel from Sterigenics, Inc. using existing monitoring instruments installed by the manufacturer on the equipment to be tested. In accordance with the procedures established in USEPA CFR40, Part 63, Subpart O, scrubber liquor level was recorded.

5.2 VOLUMETRIC FLOW MEASUREMENT

Exhaust gas flow at the outlet of the scrubber was determined by 40 CFR 60, Appendix A, Method 2, using an s-type pitot tube and an inclined-oil manometer. Sampling ports were located in accordance with 40 CFR 60, Appendix A, Method 1. The test ports were located far enough from any flow disturbances to permit accurate flow measurement.

Temperature measurements were obtained from a type K thermocouple and thermometer attached to the sampling probe. Exhaust gas composition was assumed to be air and small amounts of water vapor. Water vapor was negligible and, based on previous test data, a value of 2 percent was used for flow calculations.

5.3 CONTROL EFFICIENCY AND MASS EMISSIONS MEASUREMENT

During the first chamber evacuation of the sterilizer exhaust phase, the mass emissions of EtO vented to the inlet of the scrubber were determined using the procedures outlined in CFR40, Part 63.365. This method allows the determination of the mass of EtO vented to the inlet of the scrubber through calculations based on the Ideal Gas Law and using the conditions (pressure, temperature, volume) of the sterilization chamber immediately after it has been charged with sterilant gas, and upon conclusion of the first chamber evacuation of the exhaust phase.

The mass of EtO vented to the inlet of the scrubber during the first chamber evacuation of the exhaust phase was determined by calculating the mass of EtO present in the chamber after the first chamber evacuation and subtracting it from the mass of EtO present in the chamber after it has been charged with sterilant gas. The mass of EtO present in the chamber was calculated using Equation 1, shown below in Section 5.9.

During the first chamber evacuation of the sterilizer exhaust phase, EtO emissions from the outlet were determined using direct source sample injection into the GC. During the first chamber evacuation of the sterilizer exhaust phase, EtO emissions from the outlet were determined using direct source sample injection into the GC. During aeration, EtO emissions to the inlet and from the outlet were determined using direct source sample injection into the GC. The mass of EtO emitted from the outlet was determined using Equation 2, shown below in Section 5.9. Mass-mass control-efficiency of EtO during the sterilizer exhaust phase and aeration was calculated by comparing the mass of EtO vented to the system inlet to the mass of EtO vented from the system outlet.

During the sterilization chamber exhaust phase and aeration testing, vented gas was analyzed by an SRI, Model 8610, portable gas chromatograph (GC), equipped with the following: dual, heated sample loops and injectors; dual columns; and dual detectors. A flame ionization detector (FID) was used to quantify emissions at the AAT System inlet, and a photoionization detector (PID) was used to quantify low-level EtO emissions at the AAT System outlet.

5.4 SAMPLE TRANSPORT

Source gas was pumped to the GC at approximately 500-1000 cubic centimeters per minute (cc/min) from the sampling ports through two lengths of Teflon® sample line, each with a nominal volume of approximately 75 cubic centimeters (cc) and an outer diameter of 0.25 inch. At the inlet of the Safe Cell System, the sampling port was located in the plenum immediately upstream packed tower scrubber. At the outlet of the Safe Cell System, sampling ports were located in the exhaust stack downstream of the dry bed reactors.

5.5 GC INJECTION

Source-gas samples were then injected into the GC which was equipped with two heated sampling loops, each containing a volume of approximately 2cc and maintained at 100 degrees Celsius (C). Injections occurred at approximately one-minute intervals during the sterilization chamber exhaust phase, and at approximately five-minute intervals during aeration testing. Helium was the carrier gas for both the FID and the PID.

5.6 GC CONDITIONS

The packed columns for the GC were both operated at 90 degrees C. The columns were stainless steel, 6 feet long, 0.125 inch outer diameter, packed with 1 percent SP-1000 on 60/80 mesh Carbopack B.

During the analysis, the FID was operated at 250 degrees C. The support gases for the FID were hydrogen (99.995% pure) and air (99.9999% pure). Any unused sample gas was vented from the GC system back to the inlet of the control device being tested.

5.7 CALIBRATION STANDARDS

The FID was calibrated for mid-range part-per-million-by-volume (ppmv) level analysis using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

The PID was calibrated for low-range ppmv level analyses using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

Each of these calibration standards was in a separate, certified manufacturer's cylinder. Copies of the calibration gas laboratory certificates are attached as Appendix I.

5.8 SAMPLING DURATION

Exhaust phase EtO measurements will be taken for the entire duration of the first chamber evacuation, which will be approximately 15-30 minutes. This will encompass a total sampling duration of approximately 15-30 minutes for each exhaust phase test run.

Since aeration is a 24-hour process at this facility, with constant discharge flow from the aeration chambers to the emission-control system, aeration testing will consist of a total of three 1-hour test runs. Each test run will be performed after freshly sterilized product has been transferred into an aeration room.

5.9 CONTROL-EFFICIENCY/MASS-EMISSIONS CALCULATIONS

The following equation was used to calculate mass of EtO discharged to the inlet of the emission-control system during the first chamber evacuation of the sterilizer exhaust phase:

EQUATION 1:

$W_c = W_{ci} - W_{cf}$

Where:

W_c = Weight of EtO discharged from the sterilization chamber to the emission-control system during the first chamber evacuation, pounds

W_{ci} = (mw)(p)(P)(V)/(R)(T)

(and W_{cf})

Where:

W_{ci} = Weight of EtO present in the sterilization chamber before the first chamber evacuation, pounds

W_{cf} = Weight of EtO present in the sterilization chamber after the first chamber evacuation, pounds

MW = Molecular weight of EtO, 44.05 lb/mol

p = Percent of EtO in chamber

= W_s/W_i

Where:

W_s = Scale-measured weight of EtO charged into sterilization chamber

W_i = Calculated weight of EtO charged into sterilization chamber (@ 100%)

P = Sterilization chamber pressure (after charging/at the end of the 1st evac), psia

V = Sterilization chamber volume, ft^3

R = Gas constant, 10.73 $psia \cdot ft^3/mol \cdot {}^oR$

T = Sterilization chamber temperature (after charging/at the end of the 1st evac), ^oR

Note: Standard conditions are 68°F and 1 atm.

Mass emissions of EtO during exhaust and aeration will be calculated using the following equation:

EQUATION 2:

MassRate = (VolFlow)(MolWt)(ppmv EtO/10^6)/(MolVol)

Where:

MassRate = EtO mass flow rate, pounds per minute

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VolFlow	=	Corrected volumetric flow rate, standard cubic feet per minute at 68 degrees F
MolWt	=	44.05 pounds EtO per pound mole
ppmv EtO	=	EtO concentration, parts per million by volume
10^6	=	Conversion factor, ppmv per "cubic foot per cubic foot"
MolVol	=	385.32 cubic feet per pound mole at one atmosphere and 68 degrees F

Results of the control-efficiency testing are presented in Section 8.0 and in Tables 1 and 2.

6.0 TEST SCENARIO

During exhaust phase testing, each sterilizer was tested during normal process load conditions, but with an empty sterilization chamber to facilitate the performance of multiple test runs. All aeration testing was performed during normal process load conditions, after freshly sterilized product had been transferred into an aeration chamber/room. A total of three exhaust-phase and three aeration test runs were performed to verify the performance of the emission-control device. Testing was conducted with an effort to offer minimal disruption to the Sterigenics production schedule. The testing schedule was as follows:

1) Testing equipment was set up and calibrated.
2) Aeration Test Run #1 was performed with freshly sterilized product transferred into aeration. Sampling was performed at the inlet and outlet of the AAT System.
3) Aeration Test Run #2 was performed with freshly sterilized product transferred into aeration. Sampling was performed at the inlet and outlet of the AAT System.
4) Aeration Test Run #3 was performed with freshly sterilized product transferred into aeration. Sampling was performed at the inlet and outlet of the AAT System.
5) An empty-chamber cycle was started in one of the sterilizers.
6) Exhaust Phase Test Run #1 was conducted. Sampling was performed at outlet of the scrubber during the first chamber evacuation of the test chamber. During the performance of the test, only the sterilizer used for the test was allowed to discharge to the AAT System.
7) An empty-chamber cycle was started in one of the sterilizers.
8) Exhaust Phase Test Run #2 was conducted. Sampling was performed at outlet of the scrubber during the first chamber evacuation of the test chamber. During the performance of the test, only the sterilizer used for the test was allowed to discharge to the AAT System.
9) An empty-chamber cycle was started in one of the sterilizers.
10) Exhaust Phase Test Run #3 was conducted. Sampling was performed at outlet of the scrubber during the first chamber evacuation of the test chamber. During the performance of the test, only the sterilizer used for the test was allowed to discharge to the AAT System.
11) Post calibration check was performed, testing equipment was packed.

7.0 QA/QC

7.1 FIELD TESTING QUALITY ASSURANCE

At the beginning of the test, the sampling system was leak checked at a vacuum of 15 inches of mercury. The sampling system was considered leak free when the flow indicated by the rotameters fell to zero.

At the beginning of the test, a system blank was analyzed to ensure that the sampling system was free of EtO. Ambient air was introduced at the end of the heated sampling line and drawn through the sampling system line to the GC for analysis. The resulting chromatogram also provided a background level for non-EtO components (i.e. ambient air, carbon dioxide, water vapor) which are present in the source gas stream due to the ambient dilution air which is drawn into the emission-control device, and due to the destruction of EtO by the emission-control device which produces carbon dioxide and water vapor. This chromatogram, designated AMB, is included with the calibration data in Appendix A.

7.2 CALIBRATION PROCEDURES

The GC system was calibrated at the beginning and conclusion of each day's testing. Using the Peaksimple II analytical software, a point-to-point calibration curve was constructed for each detector. A gas cylinder of similar composition as the calibration gases, but certified by a separate supplier, was used to verify calibration gas composition and GC performance.

All calibration gases and support gases used were of the highest purity and quality available. A copy of the laboratory certification for each calibration gas is attached as Appendix I.

8.0 TEST RESULTS

The AAT Safe Cell System demonstrated an EtO control efficiency of 99.96 percent for aeration, and 99.94 percent for exhaust. In accordance with EPA requirements, as specified in the IEPA Air Quality Permit, this control equipment must have an EtO control efficiency of 99 percent or more in control of emissions from exhaust and from aeration. The AAT Safe Cell System met this requirement.

The test results are summarized in Table 1 and 2. This table includes results for EtO control efficiency of the emission-control device. Chromatograms and chromatographic supporting data are attached as Appendices A through G. Copies of field data and calculation worksheets are attached as Appendix H.

TABLES

TABLE 1
ETHYLENE OXIDE CONTROL EFFICIENCY - AERATION OF AN AAT SAFE CELL EMISSION CONTROL DEVICE OPERATED BY STERIGENICS, INC. IN WILLOWBROOK, ILLINOIS (PLANT 2) ON DECEMBER 13, 2016

RUN NUMBER	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
1(3)	1000	25.7	0.01	99.9611
1	1005	25.5	0.01	99.9608
1	1010	25.9	0.01	99.9614
1	1015	23.5	0.01	99.9574
1	1020	25.8	0.01	99.9612
1	1025	25.7	0.01	99.9611
1	1030	25.7	0.01	99.9611
1	1035	25.5	0.01	99.9608
1	1040	25.5	0.01	99.9608
1	1045	25.5	0.01	99.9608
1	1050	25.2	0.01	99.9603
1	1055	25.0	0.01	99.9600
2(4)	1100	25.0	0.01	99.9600
2	1105	25.4	0.01	99.9606
2	1110	25.8	0.01	99.9612
2	1115	25.8	0.01	99.9612
2	1120	25.8	0.01	99.9612
2	1125	25.4	0.01	99.9606
2	1130	25.4	0.01	99.9606
2	1135	25.4	0.01	99.9606
2	1140	24.8	0.01	99.9597
2	1145	25.5	0.01	99.9608
2	1150	25.1	0.01	99.9602
2	1155	24.9	0.01	99.9598
3(5)	1534	22.3	0.01	99.9552
3	1539	22.7	0.01	99.9559
3	1544	23.1	0.01	99.9567
3	1549	23.2	0.01	99.9569
3	1554	23.5	0.01	99.9574
3	1559	23.4	0.01	99.9573
3	1604	23.6	0.01	99.9576
3	1609	23.8	0.01	99.9580
3	1614	23.8	0.01	99.9580
3	1619	23.8	0.01	99.9580
3	1624	23.8	0.01	99.9580
3	1629	24.1	0.01	99.9585
TIME-WEIGHTED AVERAGE:		**24.72**	**0.0100**	**99.9595**
		NYDEQ REQUIRED CONTROL EFFICIENCY:		**99%**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
(3) - Aeration Phase Test Run #1 started at 09:57, ended at 10:57.
(4) - Aeration Phase Test Run #2 started at 10:57, ended at 11:57.
(5) - Aeration Phase Test Run #3 started at 15:32, ended at 16:32.

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TABLE 2
ETHYLENE OXIDE CONTROL EFFICIENCY - EXHAUST OF AN AAT SAFE CELL EMISSION CONTROL DEVICE OPERATED BY STERIGENICS, INC. IN WILLOWBROOK, ILLINOIS (PLANT 2)
DECEMBER 13, 2016

Run #	Stack Flow (dscfm) (2)	Average Outlet Conc. (ppm) (1)	Outlet EtO Mass Flow (lbs/min) (3)	Minutes/ Cycle	Outlet EtO Mass Emissions (lbs)	Inlet EtO Mass Emissions (lbs)	EtO Control Efficiency (%)
#1	10400	1.547	0.0018416	12	0.000221	49.8	99.96
#2	10400	1.956	0.0023275	11	0.0002560	49.8	99.95
#3	10400	3.536	0.0042081	9	0.0003787	48.9	99.92
						Average EtO Control Efficiency:	**99.94**
						Required EtO Control Efficiency:	**99**

Notes: (1) - PPM = parts per million by volume
(2) - DSCFM = dry standard cubic feet per minute
(3) - LBS/MIN = EtO emissions, pounds per minute

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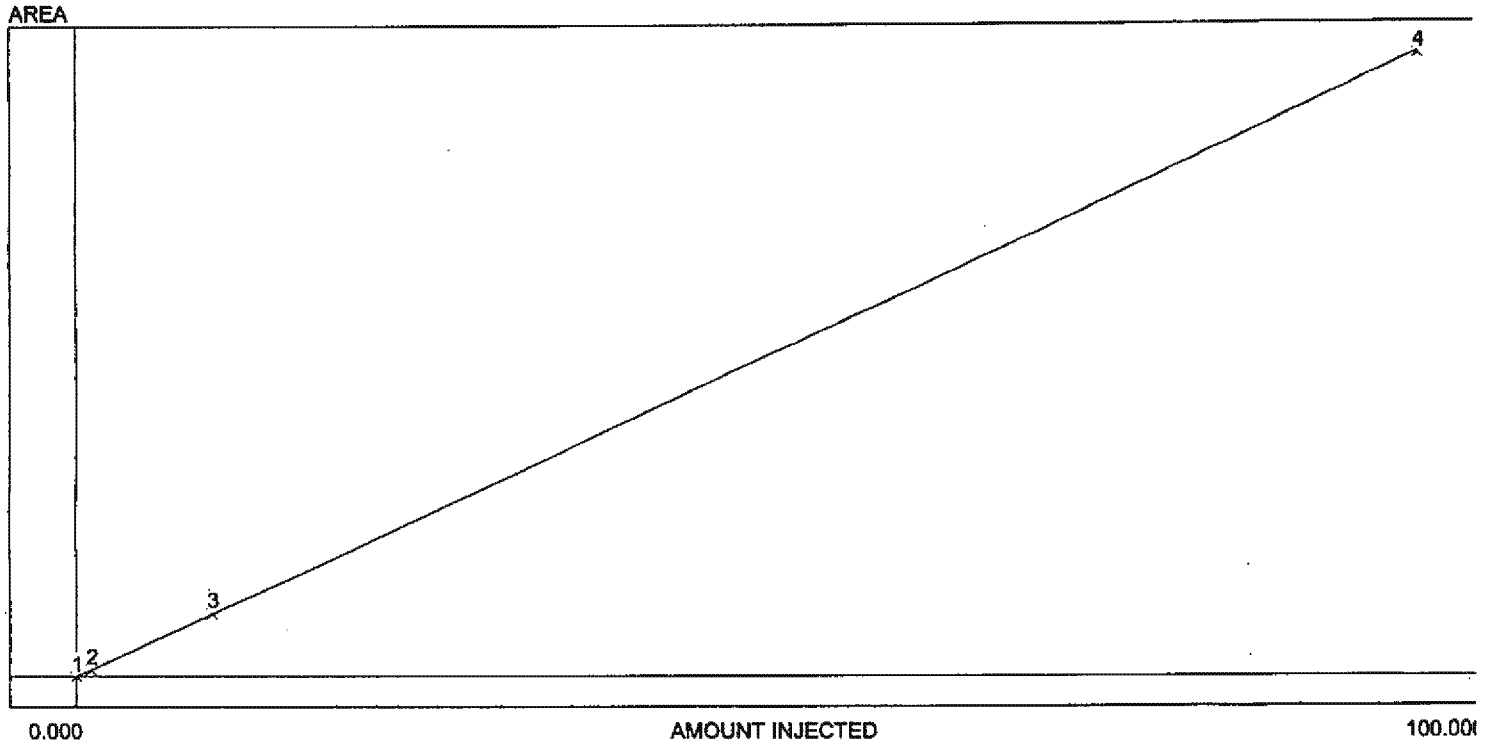
APPENDICES

APPENDIX A

Calibration Data

ak	Name	Start	End	Calibration	Int.Std	Units
	Dead Vol / Air	0.000	0.350		0.000	
	Ambient H2O	0.350	0.500		0.000	
	Ethylene Oxide	0.500	0.600	C:\peak359\1Ster	0.00016	ppm
	Acetaldehyde	0.600	0.800		0.000	
	CO2	0.800	1.000		0.000	

libration file: C:\peak359\1SterWB2016.cal

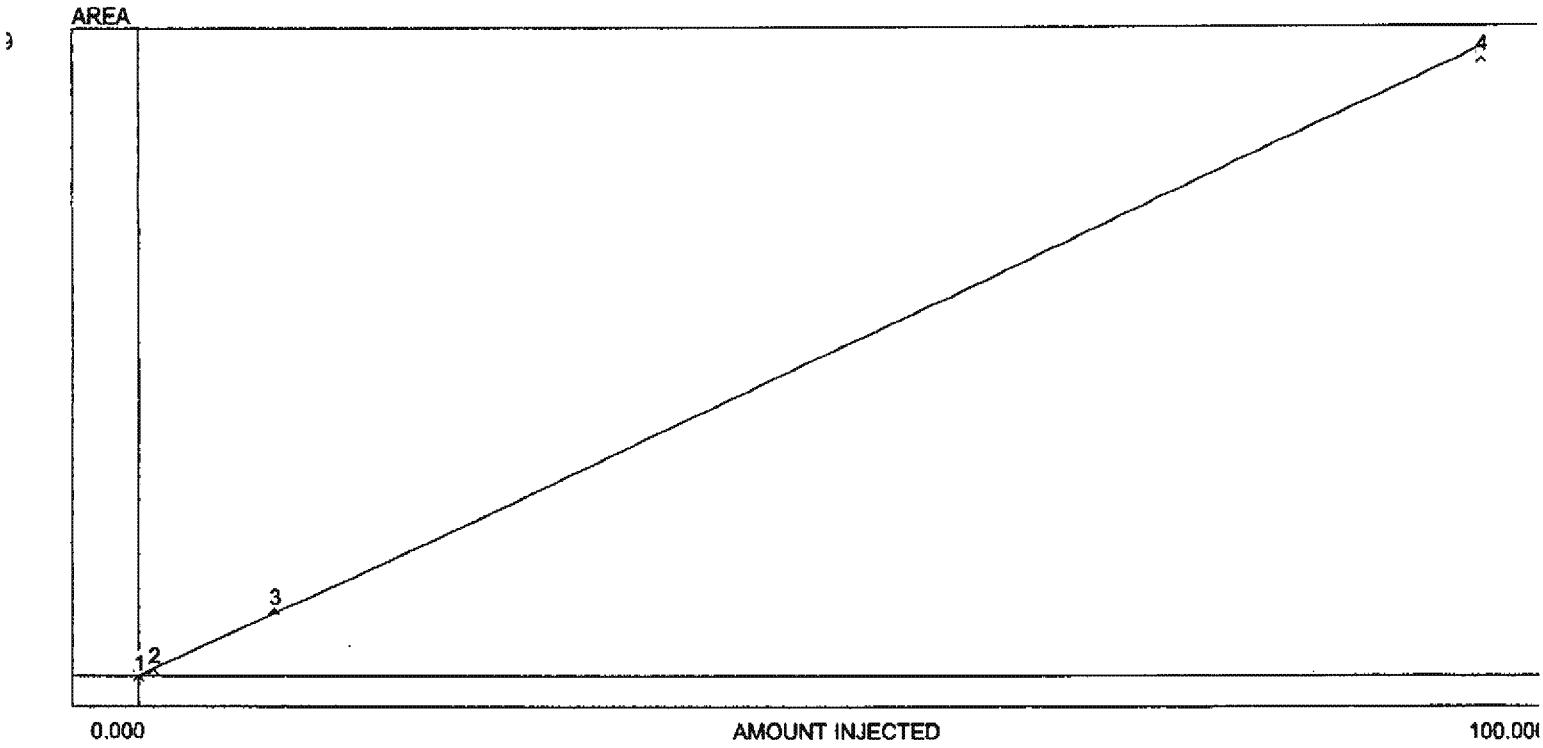


ı slope of curve: 0.43
ıxis intercept: 0.00
earity: 1.00
nber of levels: 4
/rel SD of CF's: 0.2/66.7
).4316X
1.0000
ıt calibrated: Fri Dec 02 08:01:11 2016

.Area/ht.	Amount	CF	Current	Previous #1	Previous #2
0.000	0.000	0.000	0.000	N/A	N/A
0.470	1.100	0.427	0.470	N/A	N/A
4.420	10.100	0.438	4.420	N/A	N/A
43.000	100.000	0.430	43.000	N/A	N/A

ak	Name	Start	End	Calibration	Int.Std	Units
	Dead Vol / Air	0.000	0.350		0.000	
	Ambient H2O	0.350	0.500		0.000	
	Ethylene Oxide	0.500	0.600	C:\peak359\2Ster	0.00016	ppm
	Acetaldehyde	0.600	0.800		0.000	
	CO2	0.800	1.000		0.000	

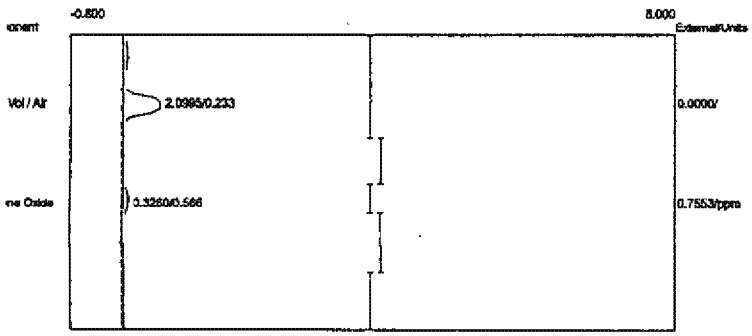
libration file: C:\peak359\2SterWB2016.cal



ɟ slope of curve: 1.82
ıxis intercept: 0.00
earity: 1.00
nber of levels: 4
/rel SD of CF's: 0.9/67.0
1.8223X
0.9999
ıt calibrated: Fri Dec 02 08:00:23 2016

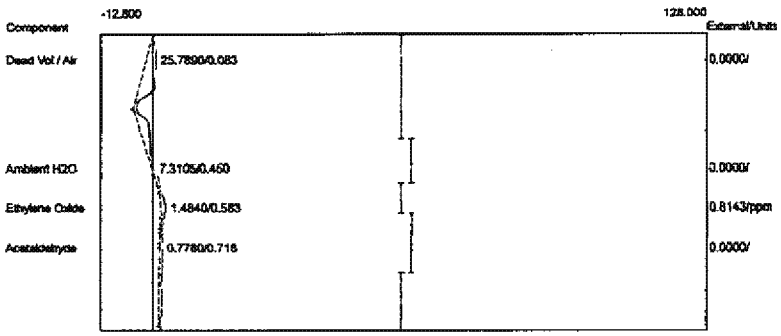
Area/ht.	Amount	CF	Current	Previous #1	Previous #2
0.000	0.000	0.000	0.000	N/A	N/A
1.910	1.100	1.736	1.910	N/A	N/A
19.600	10.100	1.941	19.600	N/A	N/A
179.000	100.000	1.790	179.000	N/A	N/A

Client: Sterigenics - Willowbrook 2
Client ID: PreCal
ıalysis date: 12/13/2016 11:35:08
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-Amb.CHR (c:\peak359)
Sample: Ambient Background
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.233	2.0995	0.0000	
ylene Oxide	0.566	0.3260	0.7553	ppm
		2.4255	0.7553	

Client: Sterigenics - Willowbrook 2
Client ID: PreCal
Analysis date: 12/13/2016 11:35:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-Amb.CHR (c:\peak359)
Sample: Ambient Background
Operator: D. Kremer

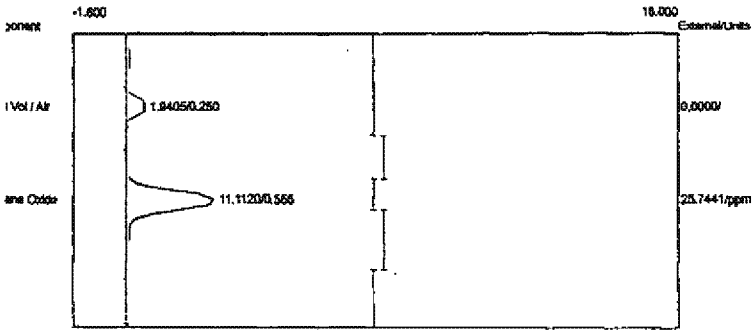


Component	Retention	Area	External	Units
Dead Vol / Air	0.083	25.7890	0.0000	
Ambient H2O	0.450	7.3105	0.0000	
Ethylene Oxide	0.583	1.4840	0.8143	ppm
Acetaldehyde	0.716	0.7780	0.0000	
		35.3615	0.8143	

APPENDIX B

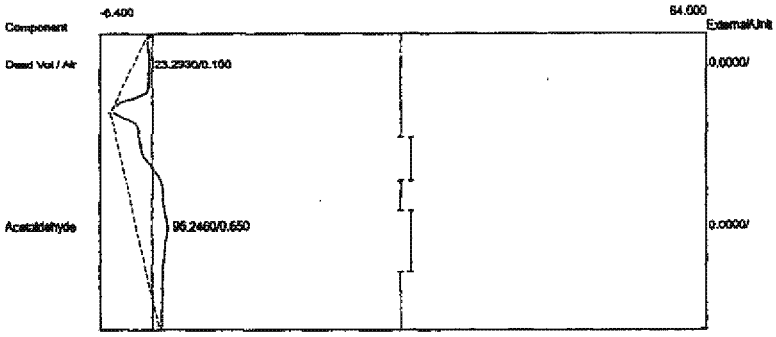
Run#1 Chromatograms - Aeration

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
nalysis date: 12/13/2016 10:00:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A01.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



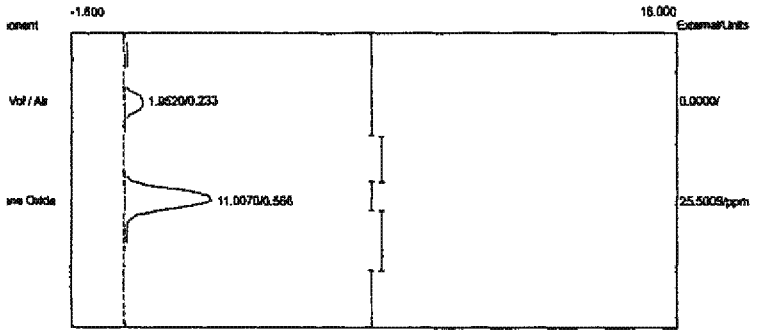
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9405	0.0000	
ıylene Oxide	0.566	11.1120	25.7441	ppm
		13.0525	25.7441	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:00:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A01.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



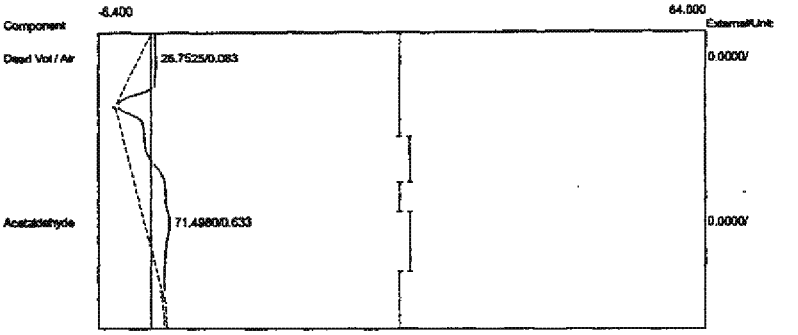
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	23.2930	0.0000	
Acetaldehyde	0.650	96.2460	0.0000	
		119.5390	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
ıalysis date: 12/13/2016 10:05:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A02.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



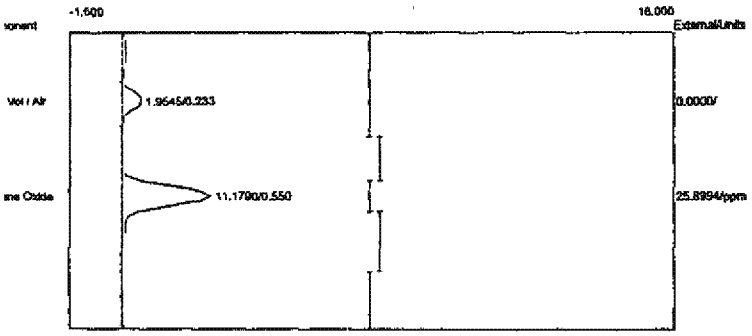
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9520	0.0000	
ıylene Oxide	0.566	11.0070	25.5009	ppm
		12.9590	25.5009	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:05:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A02.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



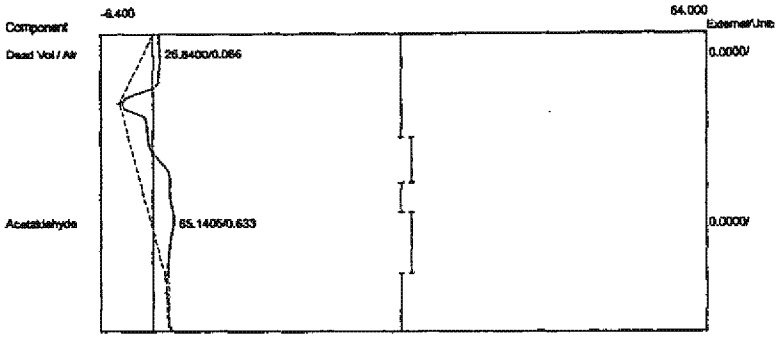
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	26.7525	0.0000	
Acetaldehyde	0.633	71.4980	0.0000	
		98.2505	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
nalysis date: 12/13/2016 10:10:08
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A03.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



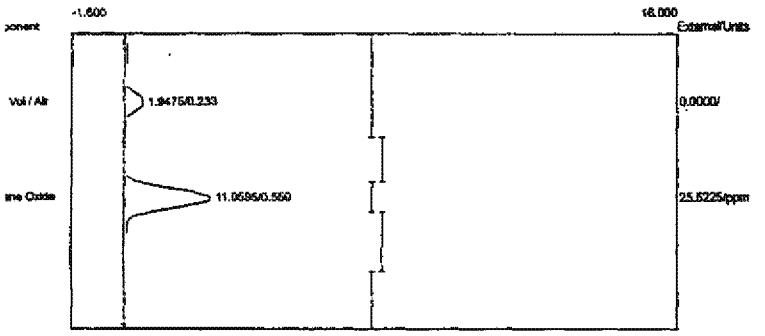
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9545	0.0000	
ylene Oxide	0.550	11.1790	25.8994	ppm
		13.1335	25.8994	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:10:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A03.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



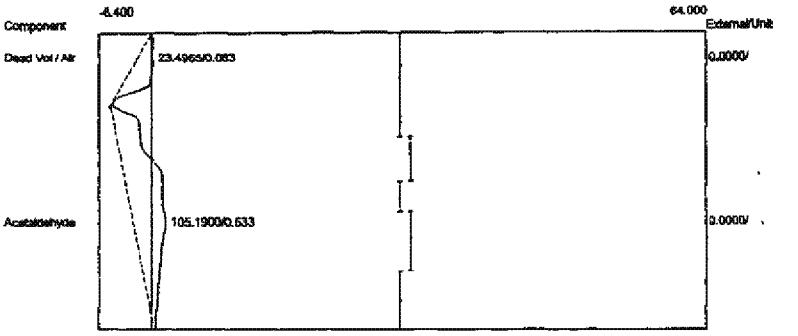
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	26.8400	0.0000	
Acetaldehyde	0.633	65.1405	0.0000	
		91.9805	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
nalysis date: 12/13/2016 10:15:21
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A04.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



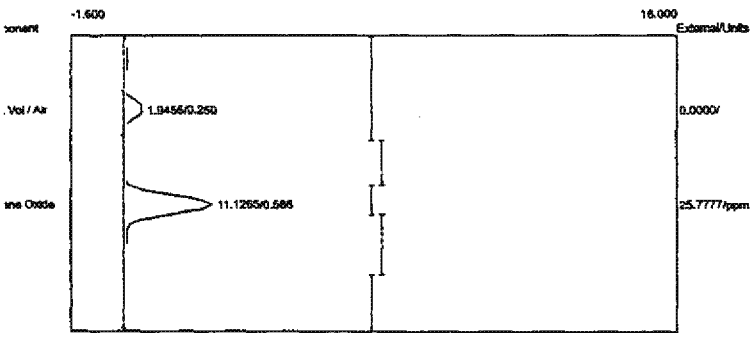
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9475	0.0000	
ylene Oxide	0.550	11.0595	25.6225	ppm
		13.0070	25.6225	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:15:21
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A04.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



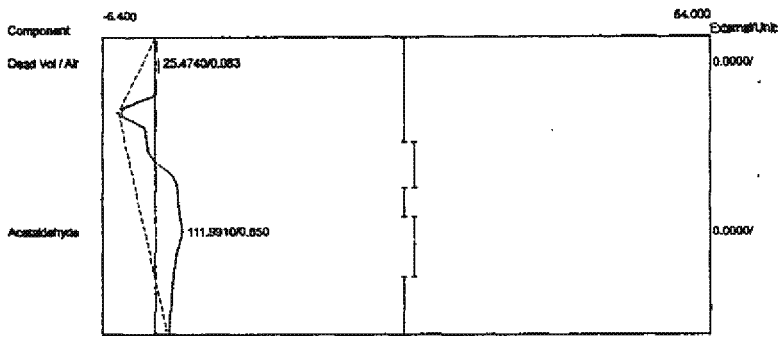
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	23.4965	0.0000	
Acetaldehyde	0.633	105.1900	0.0000	
		128.6865	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
nalysis date: 12/13/2016 10:20:42
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A05.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



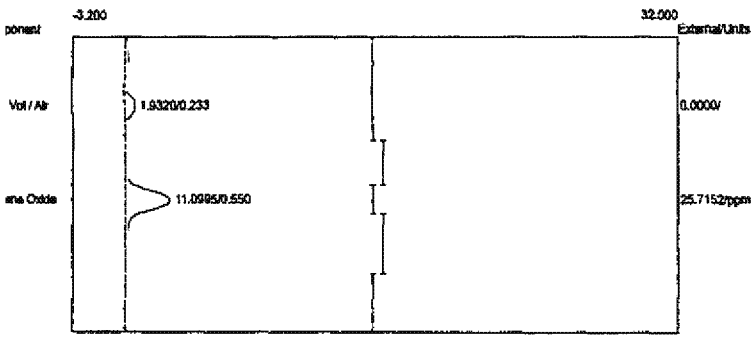
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9455	0.0000	
ylene Oxide	0.566	11.1265	25.7777	ppm
		13.0720	25.7777	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:20:42
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A05.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



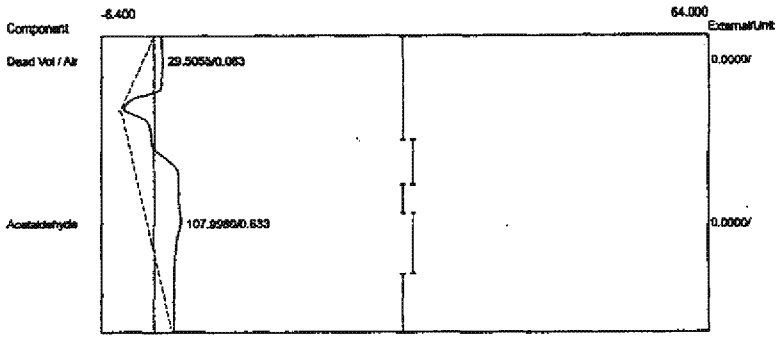
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	25.4740	0.0000	
Acetaldehyde	0.650	111.9910	0.0000	
		137.4650	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
nalysis date: 12/13/2016 10:25:04
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A06.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



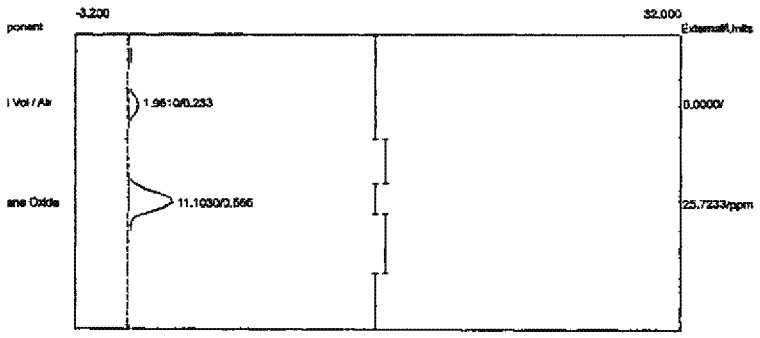
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9320	0.0000	
ylene Oxide	0.550	11.0995	25.7152	ppm
		13.0315	25.7152	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:25:04
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A06.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



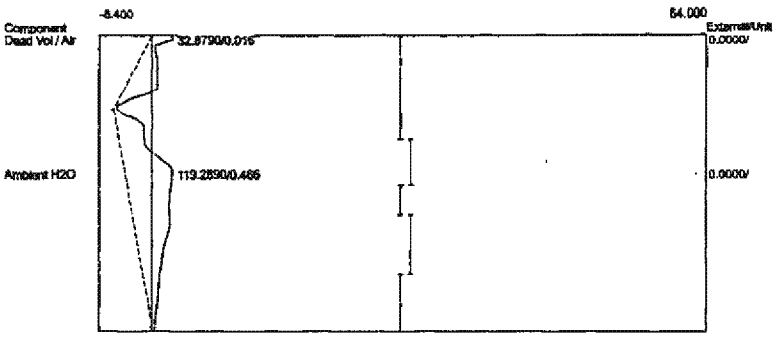
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	29.5055	0.0000	
Acetaldehyde	0.633	107.9980	0.0000	
		137.5035	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
nalysis date: 12/13/2016 10:30:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A07.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



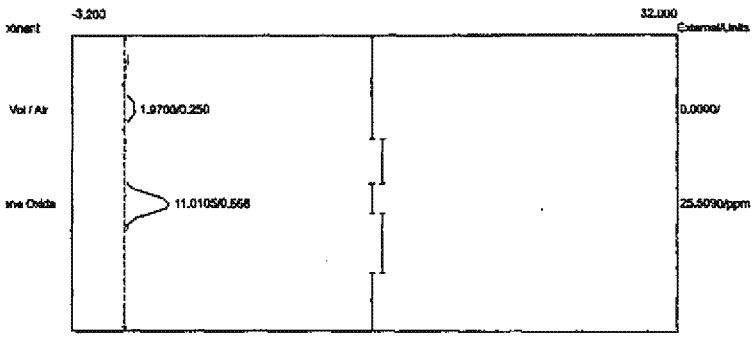
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9610	0.0000	
ıylene Oxide	0.566	11.1030	25.7233	ppm
		13.0640	25.7233	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:30:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A07.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



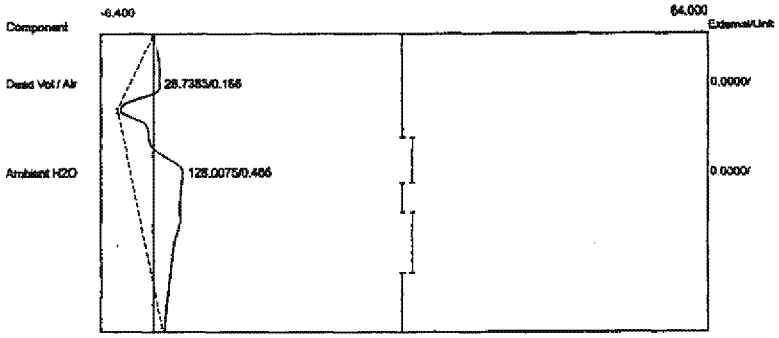
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	32.8790	0.0000	
Ambient H2O	0.466	119.2890	0.0000	
		152.1680	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
nalysis date: 12/13/2016 10:35:17
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
'omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A08.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



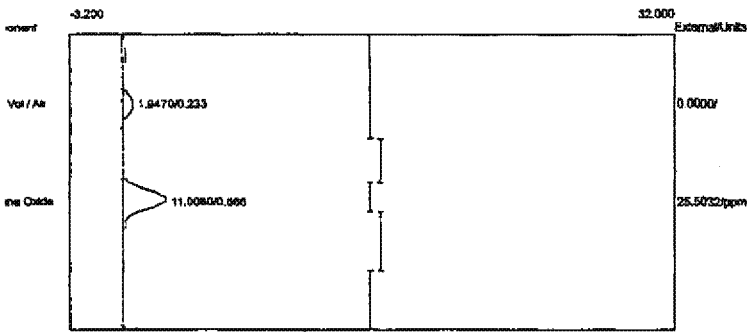
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9700	0.0000	
ylene Oxide	0.566	11.0105	25.5090	ppm
		12.9805	25.5090	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:35:17
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A08.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



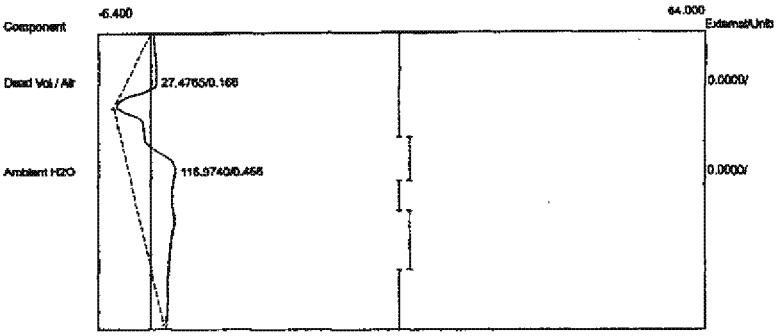
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	28.7385	0.0000	
Ambient H2O	0.466	128.0075	0.0000	
		156.7460	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
ıalysis date: 12/13/2016 10:40:15
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A09.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



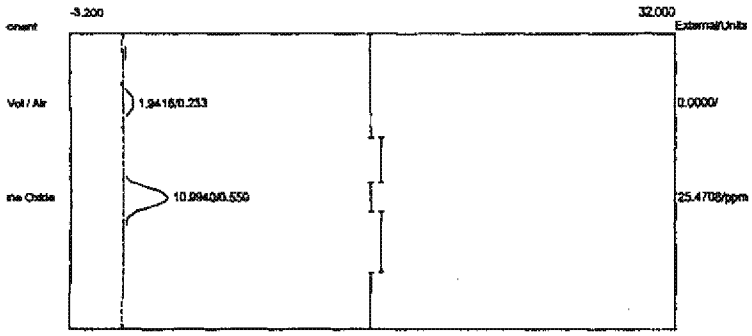
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9470	0.0000	
ıylene Oxide	0.566	11.0080	25.5032	ppm
		12.9550	25.5032	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:40:15
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A09.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



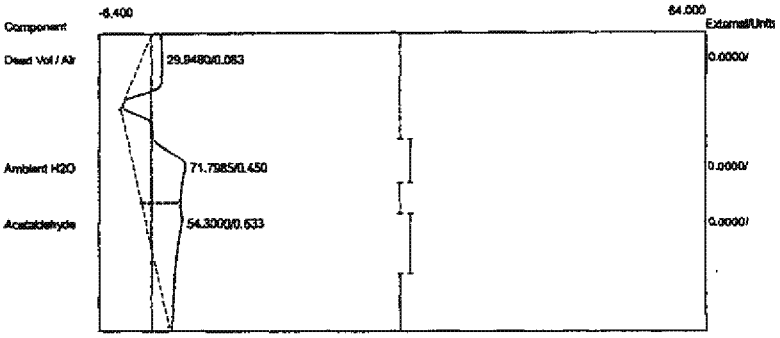
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	27.4765	0.0000	
Ambient H2O	0.466	116.9740	0.0000	
		144.4505	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
ıalysis date: 12/13/2016 10:45:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A10.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



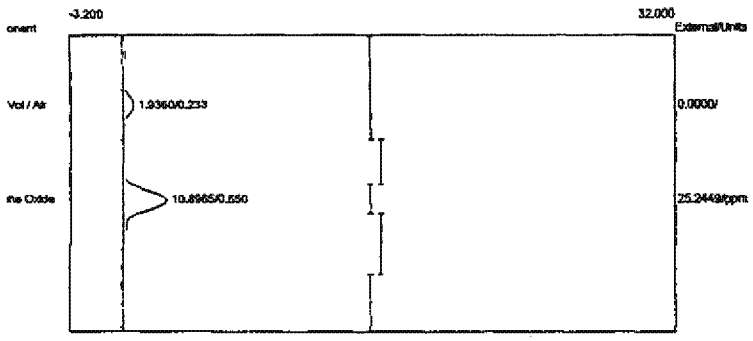
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9415	0.0000	
ıylene Oxide	0.550	10.9940	25.4708	ppm
		12.9355	25.4708	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:45:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A10.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



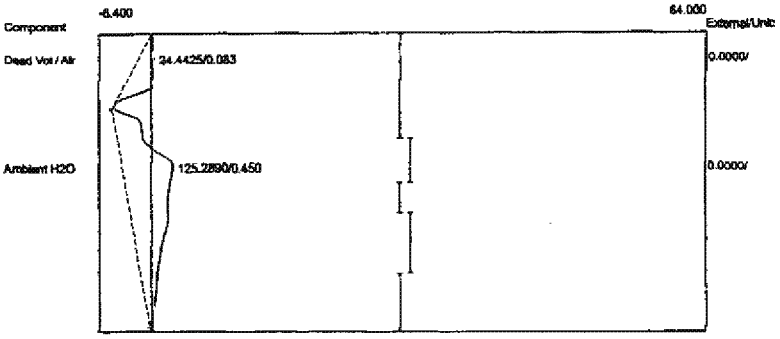
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	29.9480	0.0000	
Ambient H2O	0.450	71.7985	0.0000	
Acetaldehyde	0.633	54.3000	0.0000	
		156.0465	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
ıalysis date: 12/13/2016 10:50:16
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A11.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



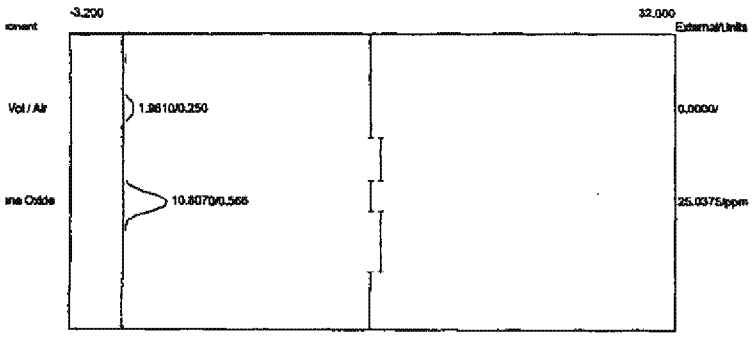
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9360	0.0000	
ıylene Oxide	0.550	10.8965	25.2449	ppm
		12.8325	25.2449	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:50:16
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A11.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



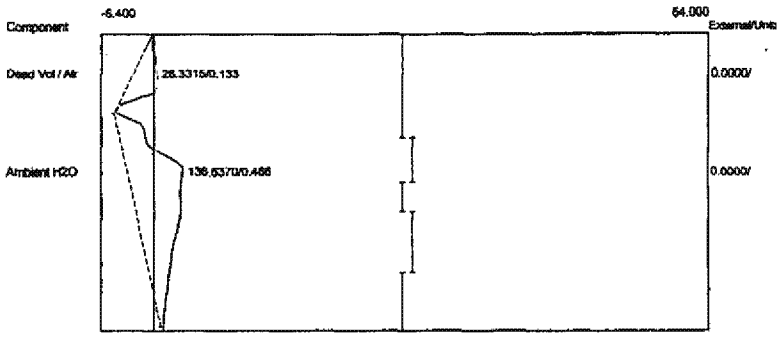
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	24.4425	0.0000	
Ambient H2O	0.450	125.2890	0.0000	
		149.7315	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
ıalysis date: 12/13/2016 10:55:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A12.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9610	0.0000	
ıylene Oxide	0.566	10.8070	25.0375	ppm
		12.7680	25.0375	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:55:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A12.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer

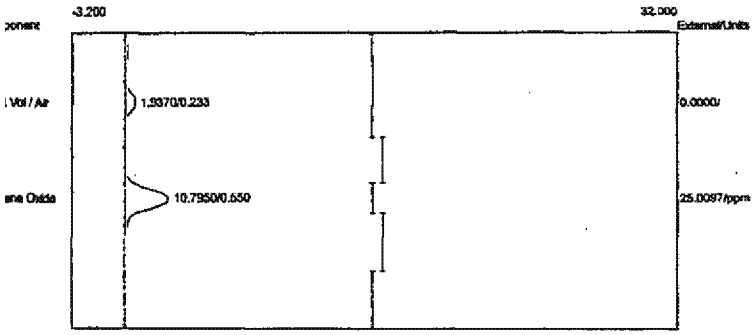


Component	Retention	Area	External	Units
Dead Vol / Air	0.133	26.3315	0.0000	
Ambient H2O	0.466	136.6370	0.0000	
		162.9685	0.0000	

APPENDIX C

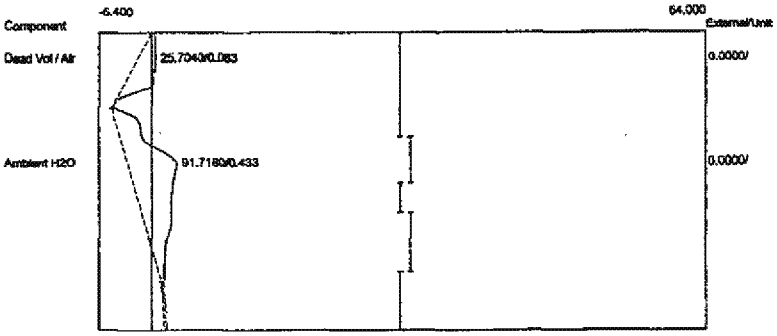
Run#2 Chromatograms - Aeration

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:00:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A01.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



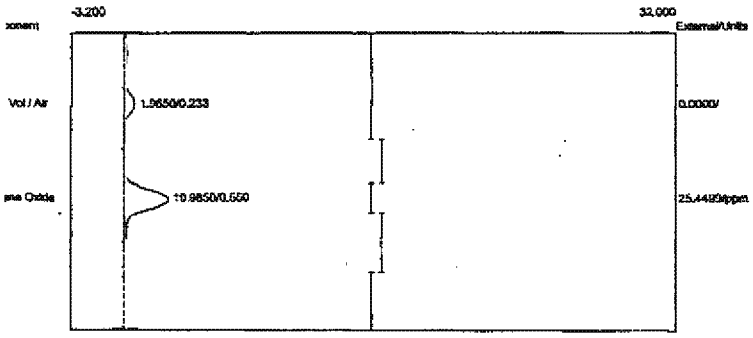
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9370	0.0000	
ylene Oxide	0.550	10.7950	25.0097	ppm
		12.7320	25.0097	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:00:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A01.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



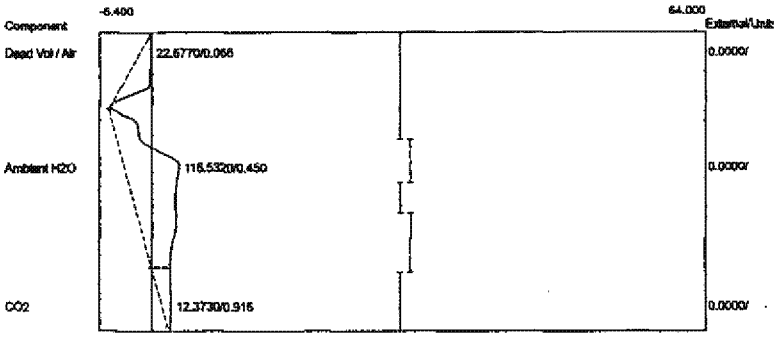
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	25.7040	0.0000	
Ambient H2O	0.433	91.7180	0.0000	
		117.4220	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:05:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A02.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



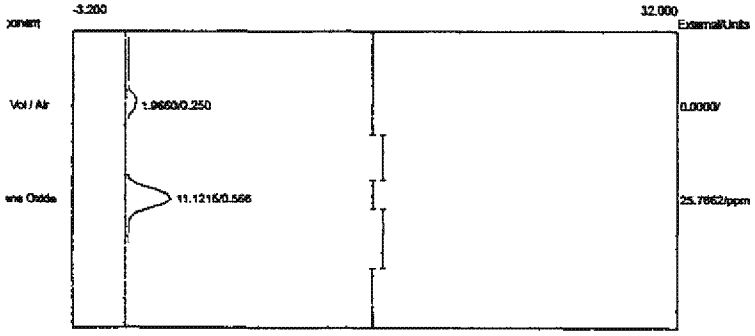
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9650	0.0000	
ylene Oxide	0.550	10.9850	25.4499	ppm
		12.9500	25.4499	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:05:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A02.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



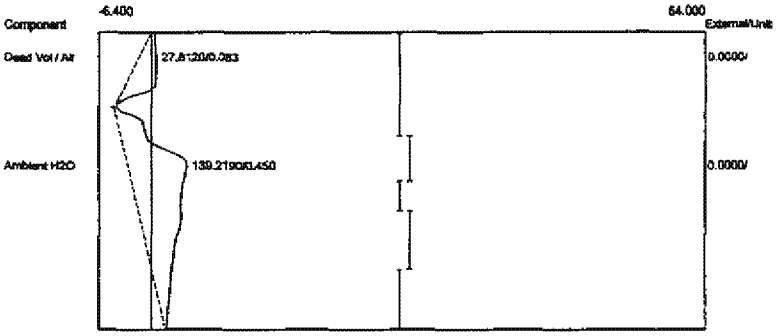
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	22.6770	0.0000	
Ambient H2O	0.450	116.5320	0.0000	
CO2	0.916	12.3730	0.0000	
		151.5820	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:10:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A03.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



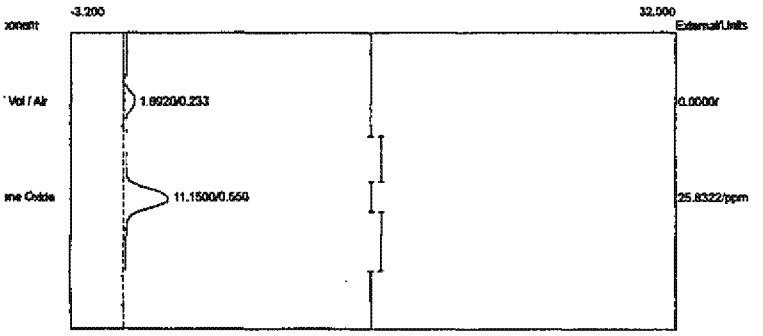
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9660	0.0000	
ylene Oxide	0.566	11.1215	25.7662	ppm
		13.0875	25.7662	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:10:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A03.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



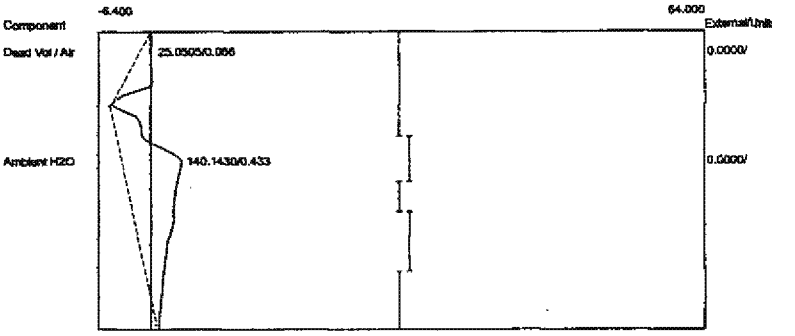
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	27.8120	0.0000	
Ambient H2O	0.450	139.2190	0.0000	
		167.0310	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:15:17
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
'omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A04.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



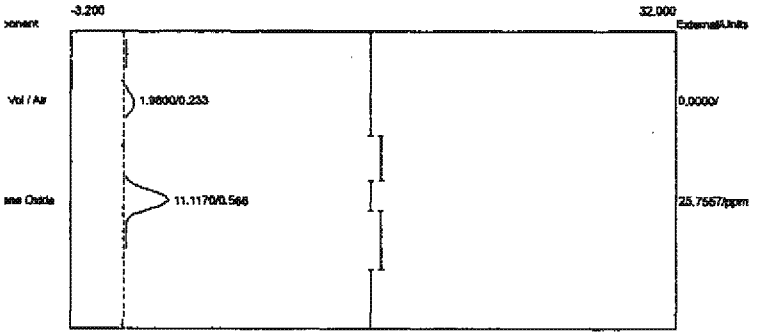
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9920	0.0000	
ıylene Oxide	0.550	11.1500	25.8322	ppm
		13.1420	25.8322	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:15:17
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A04.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



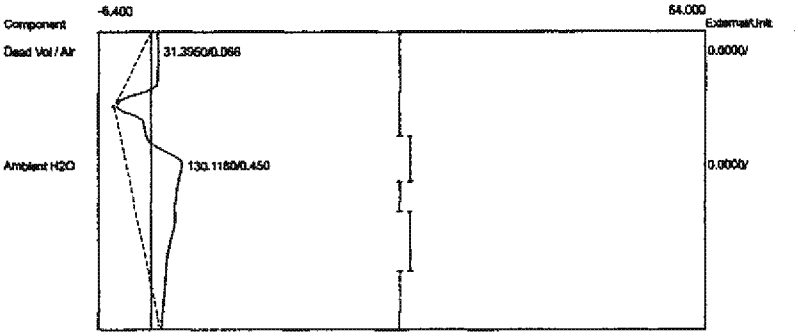
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	25.0505	0.0000	
Ambient H2O	0.433	140.1430	0.0000	
		165.1935	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:20:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A05.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



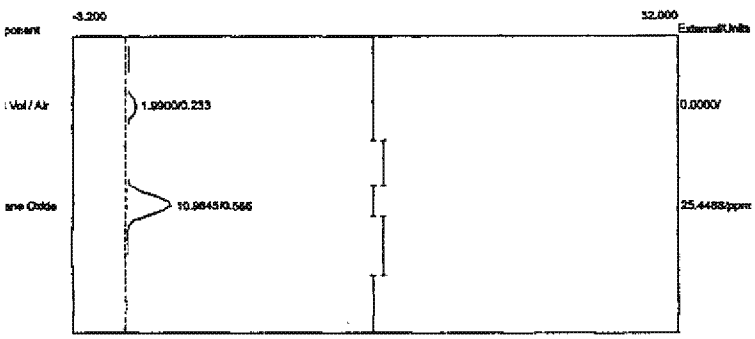
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9800	0.0000	
ylene Oxide	0.566	11.1170	25.7557	ppm
		13.0970	25.7557	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:20:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A05.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



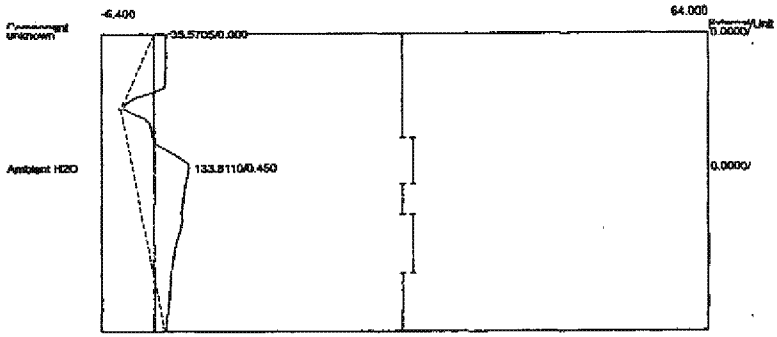
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	31.3950	0.0000	
Ambient H2O	0.450	130.1180	0.0000	
		161.5130	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:25:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A06.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



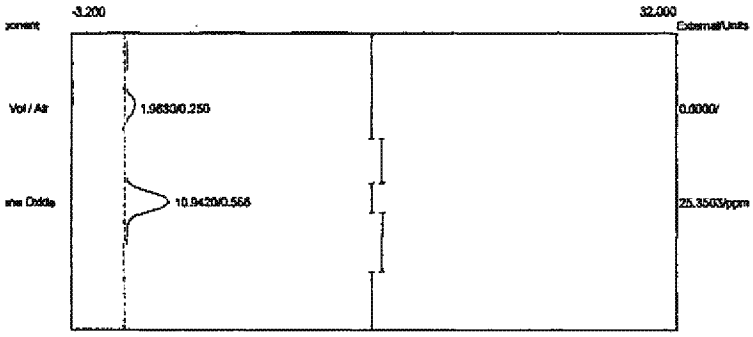
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9900	0.0000	
ıylene Oxide	0.566	10.9845	25.4488	ppm
		12.9745	25.4488	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:25:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A06.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



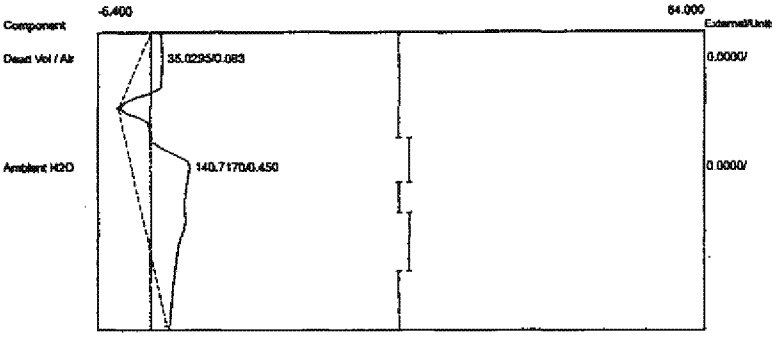
Component	Retention	Area	External	Units
Ambient H2O	0.450	133.8110	0.0000	
		133.8110	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:30:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A07.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



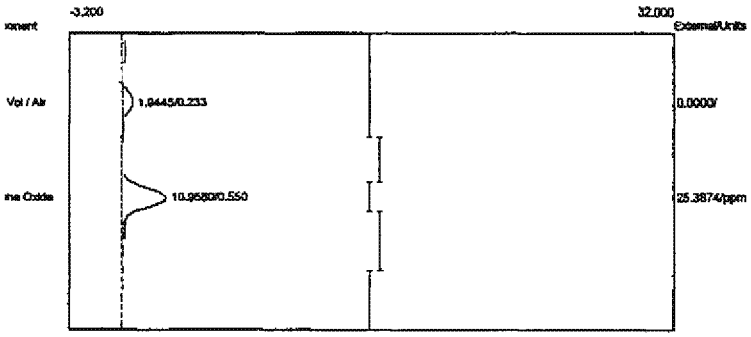
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9630	0.0000	
ylene Oxide	0.566	10.9420	25.3503	ppm
		12.9050	25.3503	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:30:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A07.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



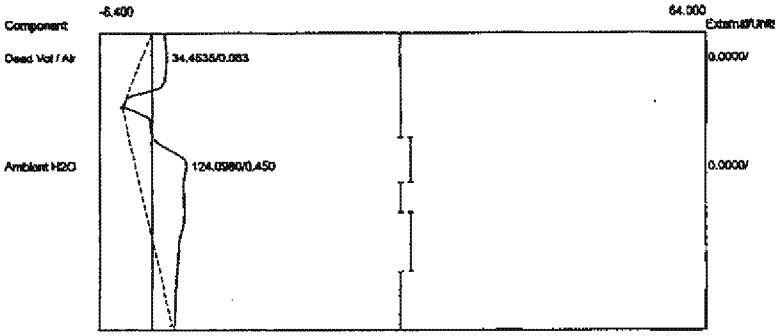
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	35.0295	0.0000	
Ambient H2O	0.450	140.7170	0.0000	
		175.7465	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
ıalysis date: 12/13/2016 11:35:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A08.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



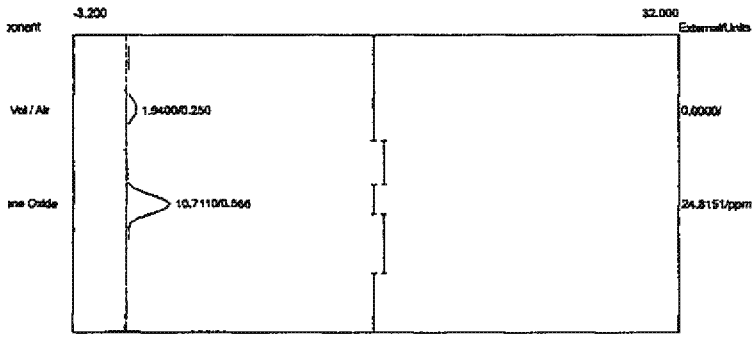
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9445	0.0000	
ıylene Oxide	0.550	10.9580	25.3874	ppm
		12.9025	25.3874	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:35:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A08.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



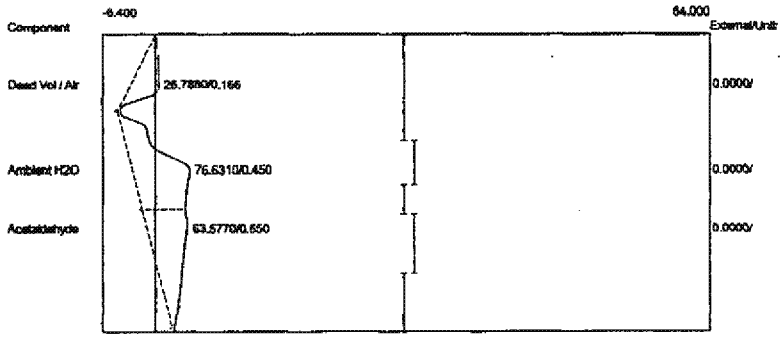
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	34.4535	0.0000	
Ambient H2O	0.450	124.0980	0.0000	
		158.5515	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:40:26
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1Ster2WB2016-2A09.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



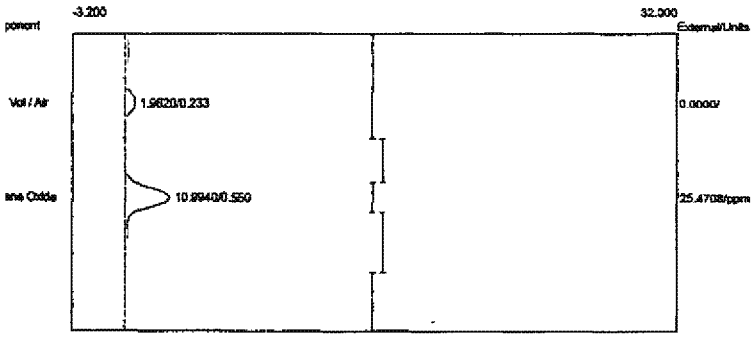
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9400	0.0000	
ylene Oxide	0.566	10.7110	24.8151	ppm
		12.6510	24.8151	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:40:26
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A09.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



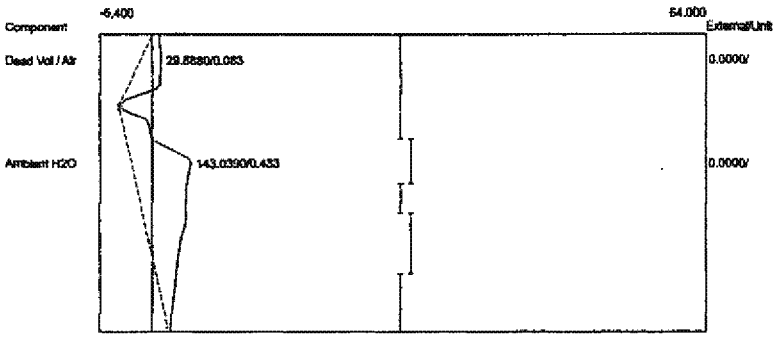
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	26.7880	0.0000	
Ambient H2O	0.450	76.6310	0.0000	
Acetaldehyde	0.650	63.5770	0.0000	
		166.9960	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:45:15
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A10.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



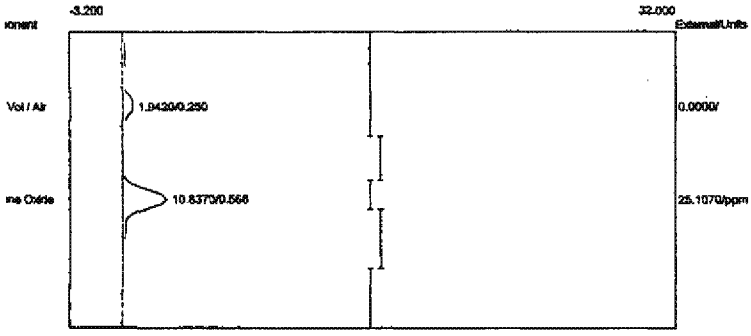
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9620	0.0000	
ylene Oxide	0.550	10.9940	25.4708	ppm
		12.9560	25.4708	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:45:15
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A10.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



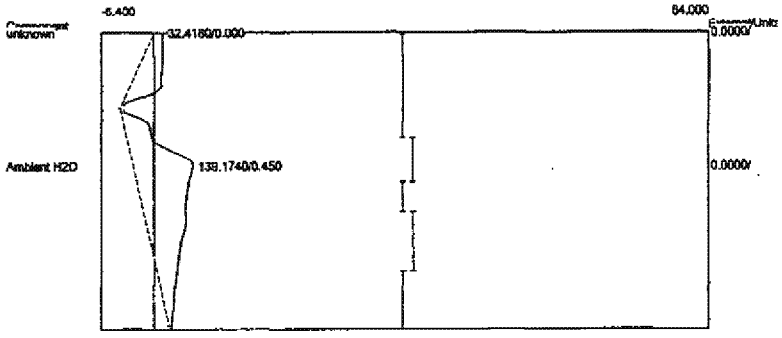
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	29.8880	0.0000	
Ambient H2O	0.433	143.0390	0.0000	
		172.9270	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
ıalysis date: 12/13/2016 11:50:13
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A11.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



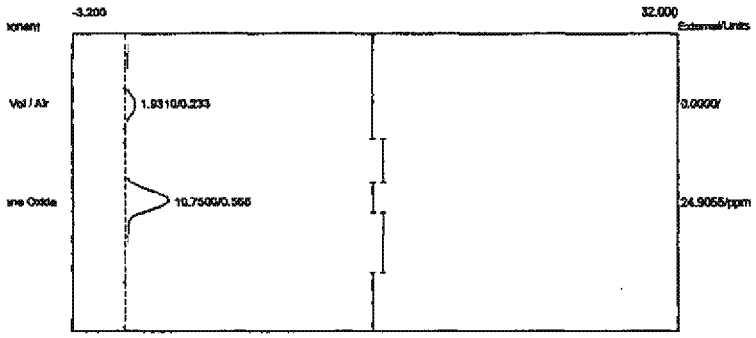
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9420	0.0000	
ıylene Oxide	0.566	10.8370	25.1070	ppm
		12.7790	25.1070	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:50:13
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A11.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



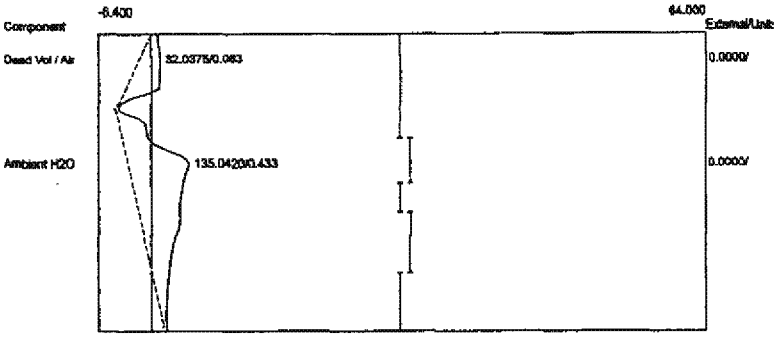
Component	Retention	Area	External	Units
Ambient H2O	0.450	139.1740	0.0000	
		139.1740	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:55:04
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A12.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9310	0.0000	
ylene Oxide	0.566	10.7500	24.9055	ppm
		12.6810	24.9055	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:55:04
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A12.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



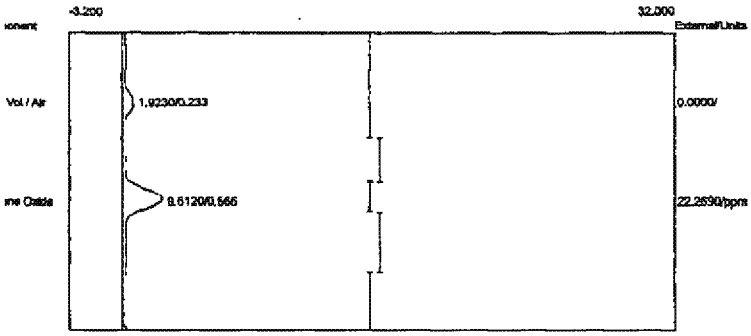
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	32.0375	0.0000	
Ambient H2O	0.433	135.0420	0.0000	
		167.0795	0.0000	

APPENDIX D

Run#3 Chromatograms - Aeration

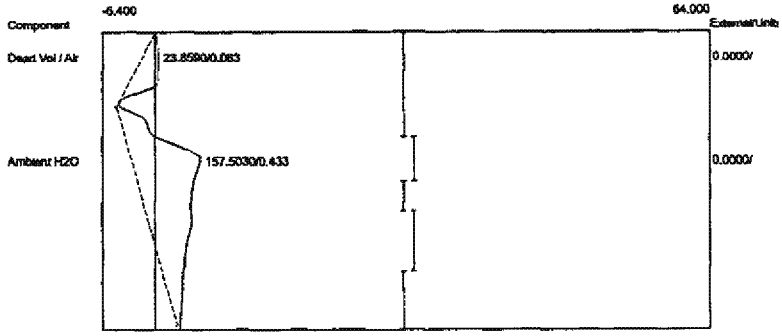
ECSi

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
ıalysis date: 12/13/2016 15:34:55
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-3A01.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



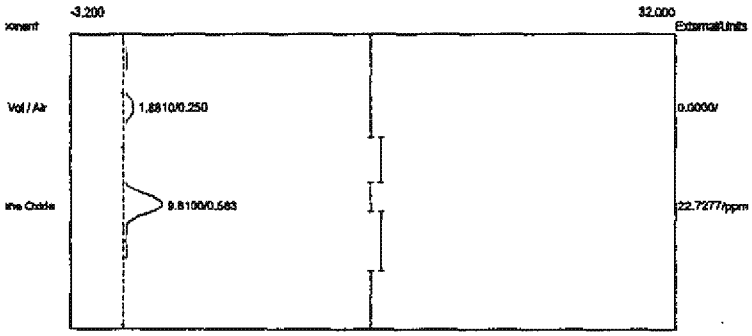
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9230	0.0000	
ıylene Oxide	0.566	9.6120	22.2690	ppm
		11.5350	22.2690	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 15:34:55
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A01.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



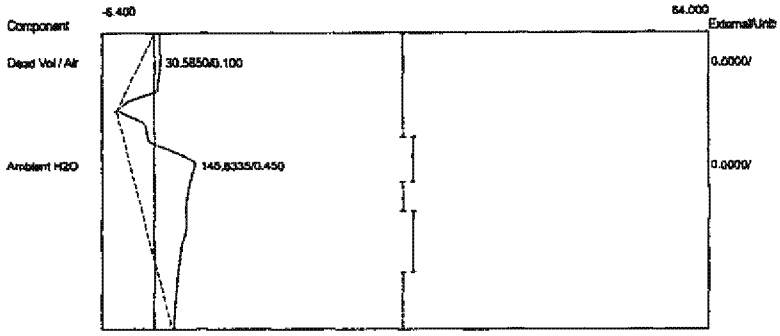
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	23.8590	0.0000	
Ambient H2O	0.433	157.5030	0.0000	
		181.3620	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
ıalysis date: 12/13/2016 15:39:40
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-3A02.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



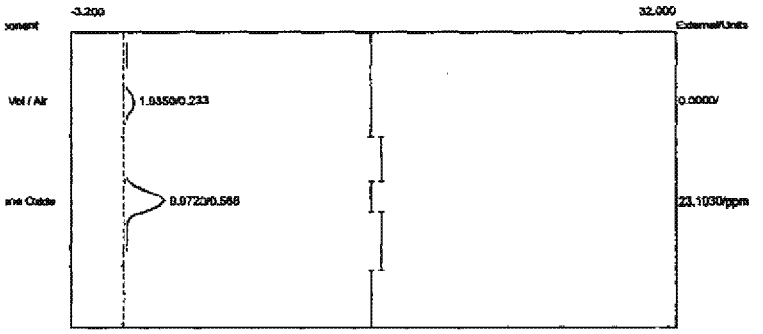
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.8810	0.0000	
ıylene Oxide	0.583	9.8100	22.7277	ppm
		11.6910	22.7277	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 15:39:40
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A02.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



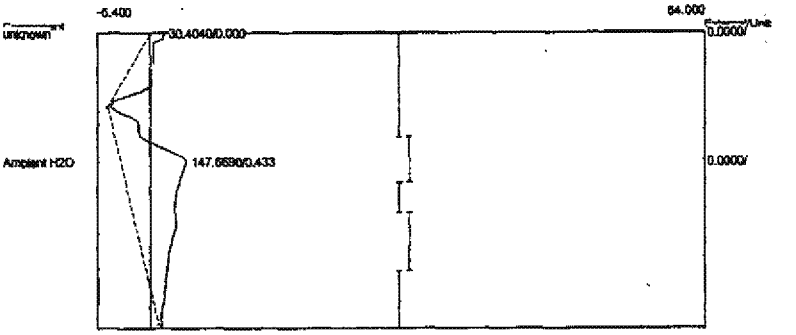
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	30.5850	0.0000	
Ambient H2O	0.450	145.8335	0.0000	
		176.4185	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 15:44:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-3A03.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



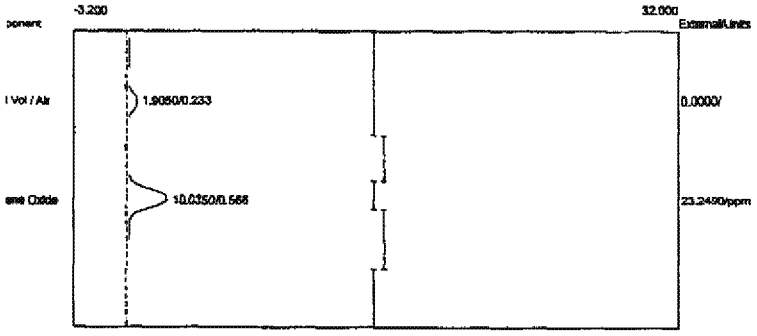
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9350	0.0000	
ylene Oxide	0.566	9.9720	23.1030	ppm
		11.9070	23.1030	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 15:44:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A03.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



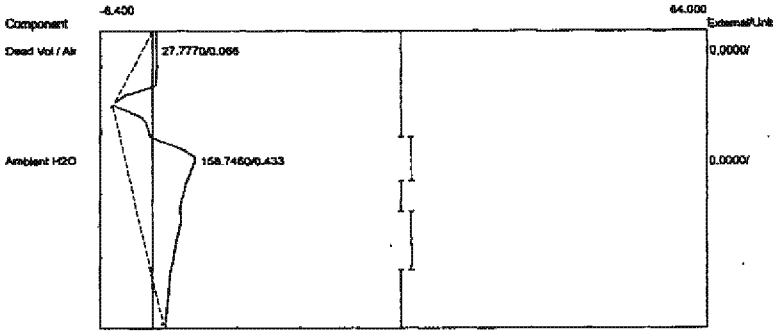
Component	Retention	Area	External	Units
Ambient H2O	0.433	147.6690	0.0000	
		147.6690	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 15:49:15
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-3A04.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



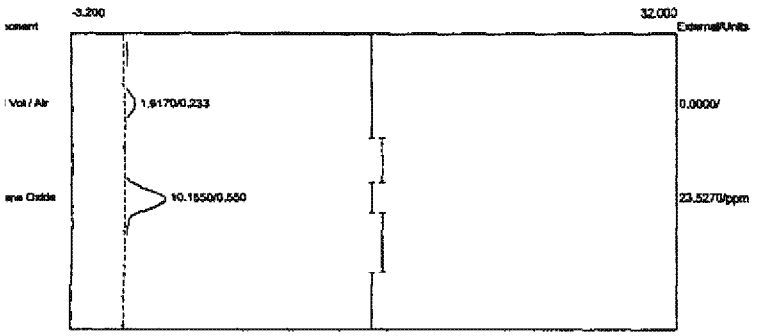
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9050	0.0000	
ıylene Oxide	0.566	10.0350	23.2490	ppm
		11.9400	23.2490	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 15:49:15
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A04.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



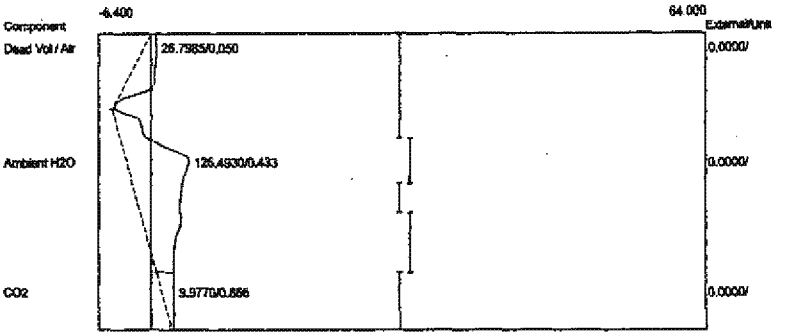
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	27.7770	0.0000	
Ambient H2O	0.433	158.7460	0.0000	
		186.5230	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 15:54:20
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-3A05.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



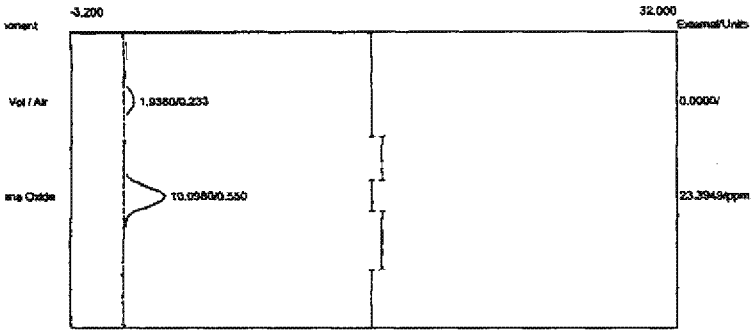
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9170	0.0000	
ylene Oxide	0.550	10.1550	23.5270	ppm
		12.0720	23.5270	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 15:54:20
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A05.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



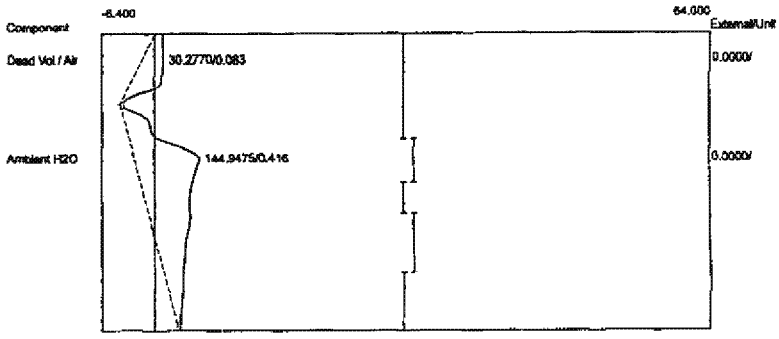
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	26.7985	0.0000	
Ambient H2O	0.433	126.4930	0.0000	
CO2	0.866	9.9770	0.0000	
		163.2685	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 15:59:16
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-3A06.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



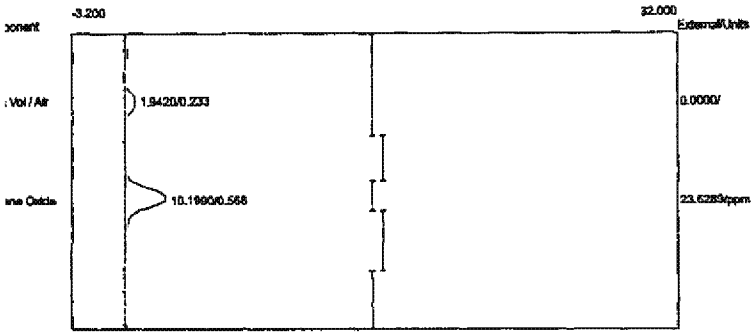
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9360	0.0000	
ylene Oxide	0.550	10.0980	23.3949	ppm
		12.0340	23.3949	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 15:59:16
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A06.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



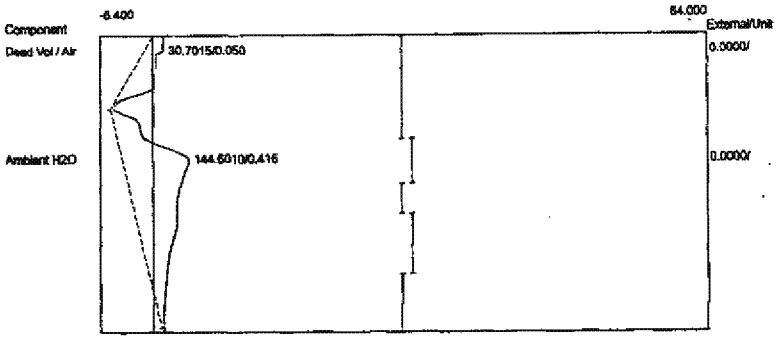
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	30.2770	0.0000	
Ambient H2O	0.416	144.9475	0.0000	
		175.2245	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 16:04:06
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-3A07.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



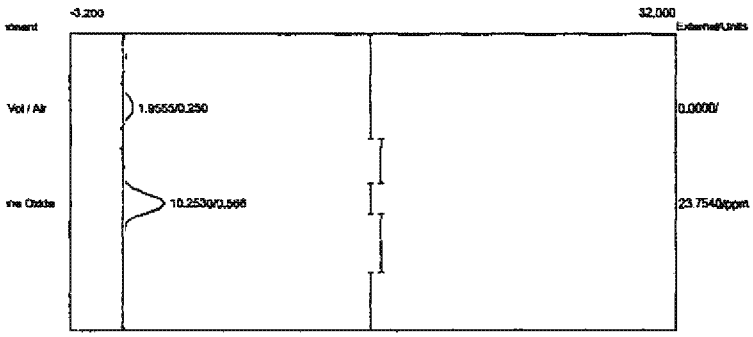
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9420	0.0000	
ıylene Oxide	0.566	10.1990	23.6289	ppm
		12.1410	23.6289	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 16:04:06
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A07.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



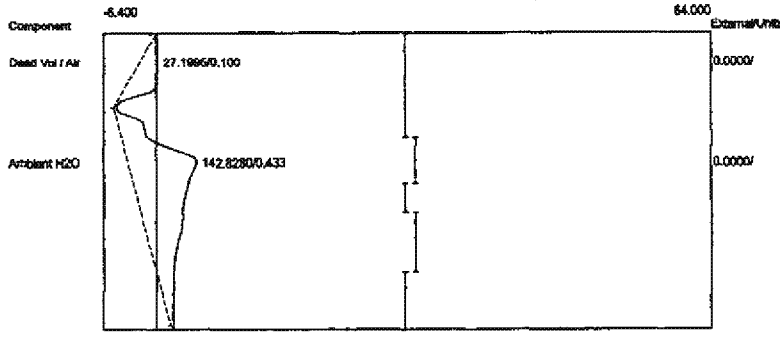
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	30.7015	0.0000	
Ambient H2O	0.416	144.6010	0.0000	
		175.3025	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
ıalysis date: 12/13/2016 16:09:04
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-3A08.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



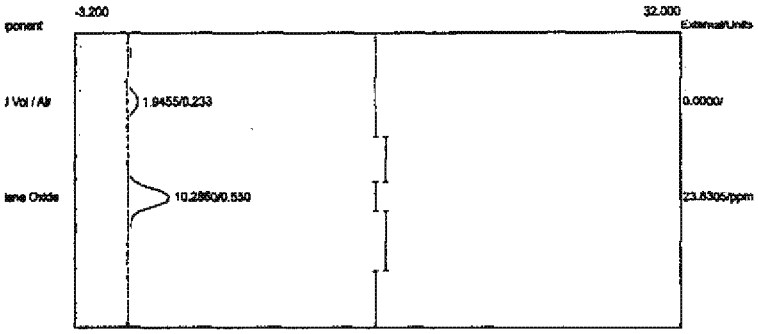
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9555	0.0000	
ıylene Oxide	0.566	10.2530	23.7540	ppm
		12.2085	23.7540	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 16:09:04
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A08.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



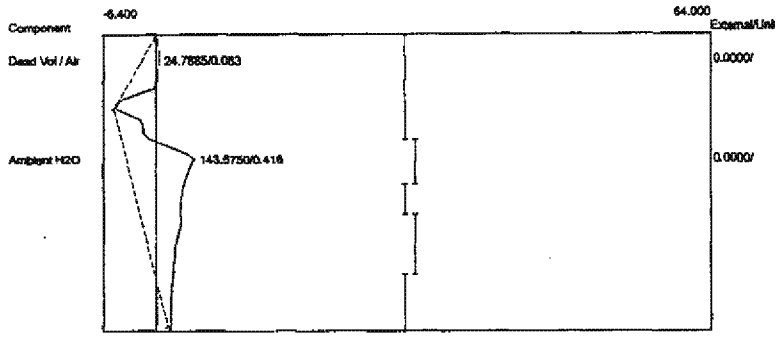
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	27.1995	0.0000	
Ambient H2O	0.433	142.8280	0.0000	
		170.0275	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 16:14:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1Ster2WB2016-3A09.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



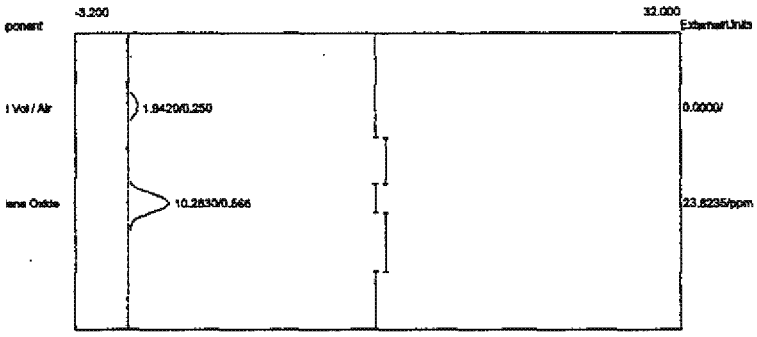
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9455	0.0000	
ylene Oxide	0.550	10.2860	23.8305	ppm
		12.2315	23.8305	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 16:14:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A09.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



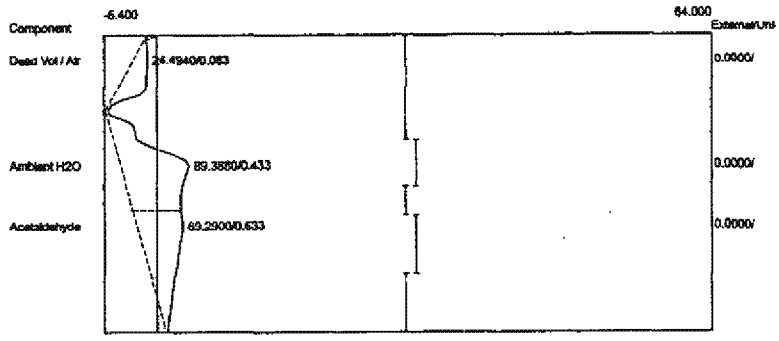
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	24.7885	0.0000	
Ambient H2O	0.416	143.6750	0.0000	
		168.4635	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 16:19:30
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1Ster2WB2016-3A10.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



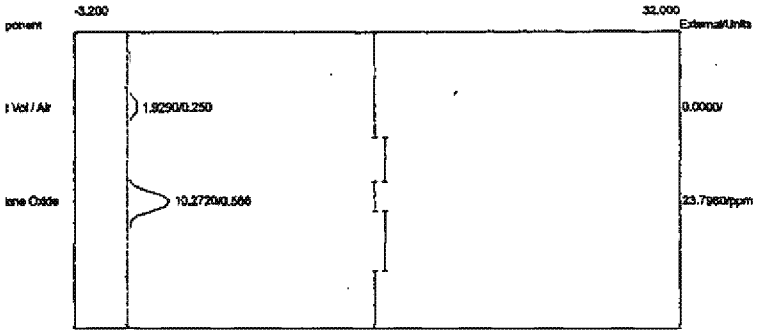
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9420	0.0000	
ylene Oxide	0.566	10.2830	23.8235	ppm
		12.2250	23.8235	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 16:19:30
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A10.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



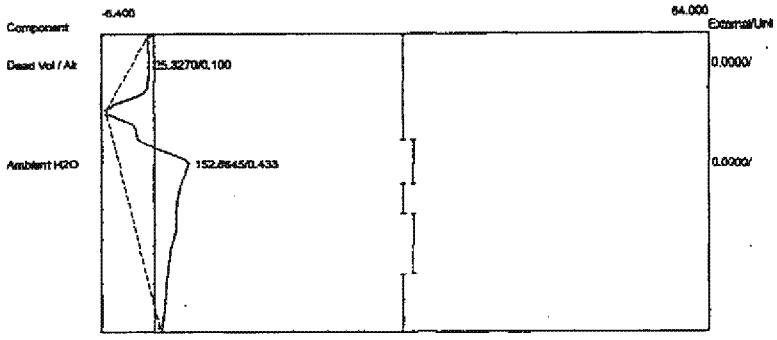
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	24.4940	0.0000	
Ambient H2O	0.433	89.3880	0.0000	
Acetaldehyde	0.633	69.2900	0.0000	
		183.1720	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 16:24:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1Ster2WB2016-3A11.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



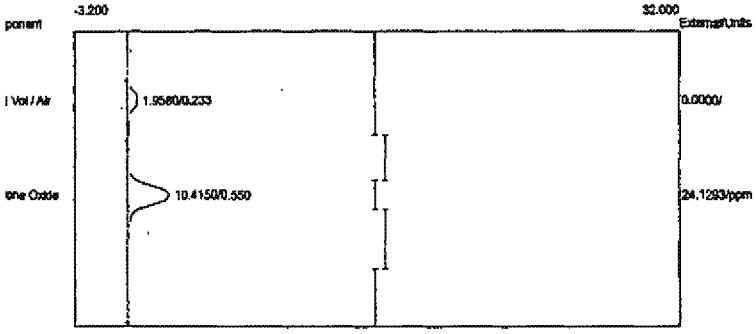
Component	Retention	Area	External	Units
ead Vol / Air	0.250	1.9290	0.0000	
ylene Oxide	0.566	10.2720	23.7980	ppm
		12.2010	23.7980	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 16:24:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A11.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



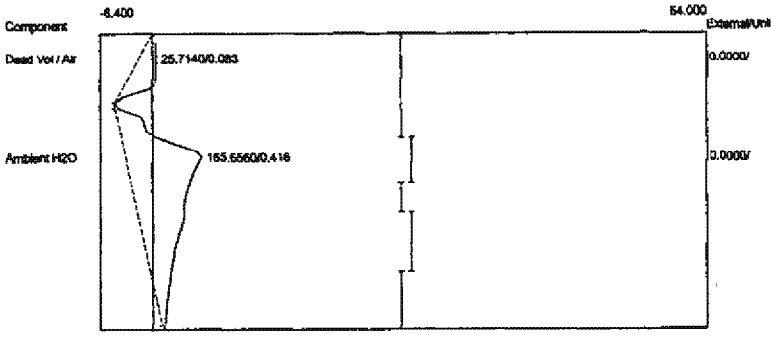
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	25.3270	0.0000	
Ambient H2O	0.433	152.8645	0.0000	
		178.1915	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 16:29:17
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-3A12.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
:ad Vol / Air	0.233	1.9580	0.0000	
ıylene Oxide	0.550	10.4150	24.1293	ppm
		12.3730	24.1293	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 16:29:17
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A12.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



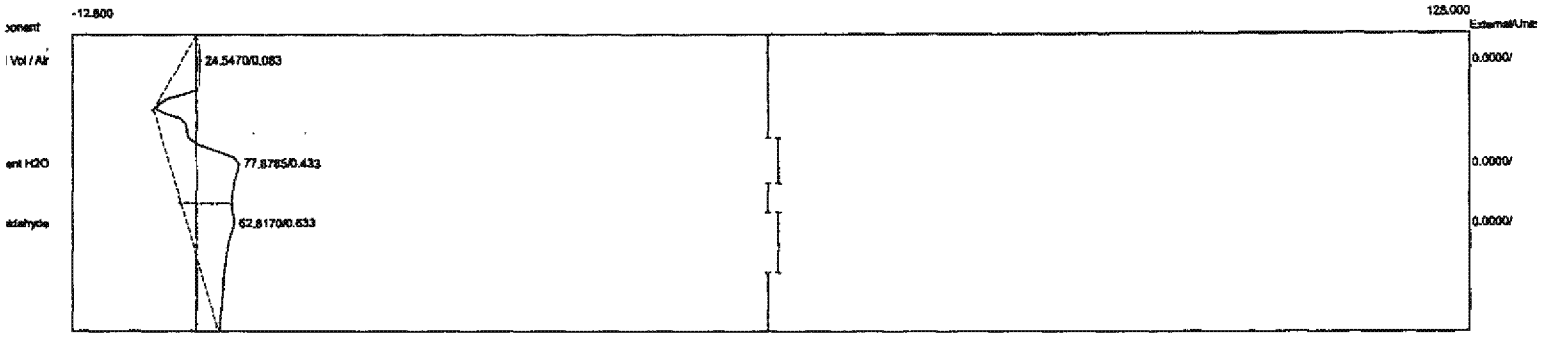
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	25.7140	0.0000	
Ambient H2O	0.416	165.6560	0.0000	
		191.3700	0.0000	

APPENDIX E

Run#1 Chromatograms - Exhaust

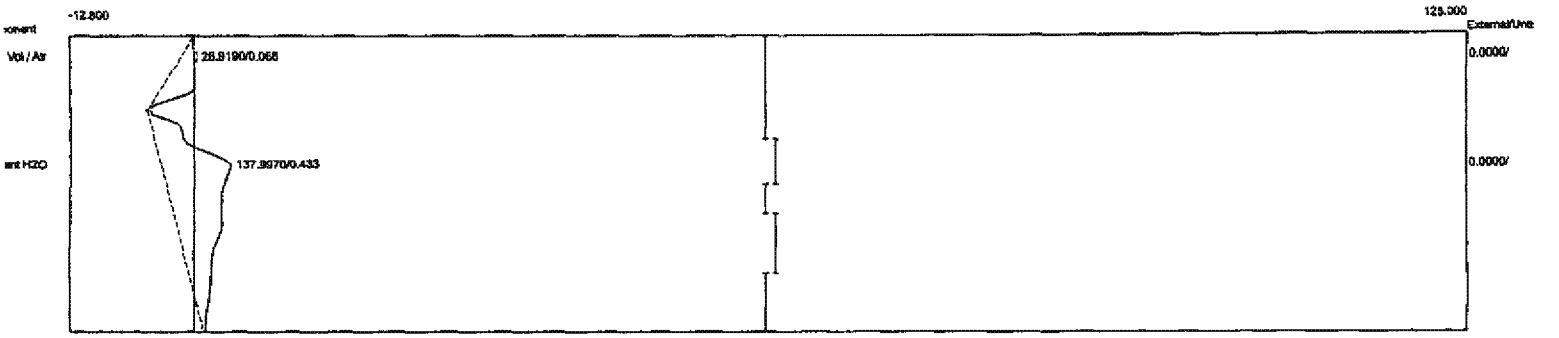
ECSi

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Exh
nalysis date: 12/13/2016 12:50:57
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster2WB2016-1E01.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



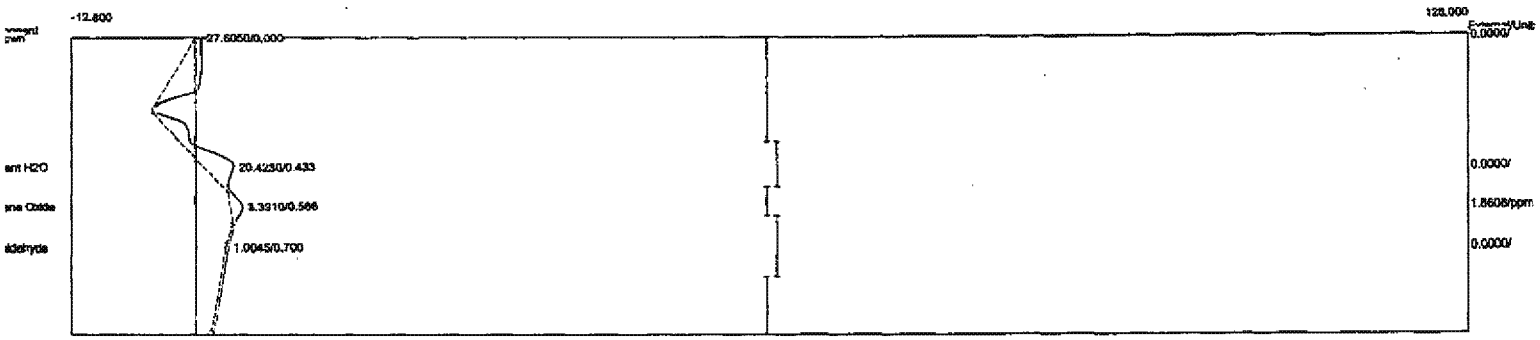
Component	Retention	Area	External	Units
ad Vol / Air	0.083	24.5470	0.0000	
ıbient H2O	0.433	77.8785	0.0000	
etaldehyde	0.633	62.8170	0.0000	
		165.2425	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Exh
nalysis date: 12/13/2016 12:52:07
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-1E02.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



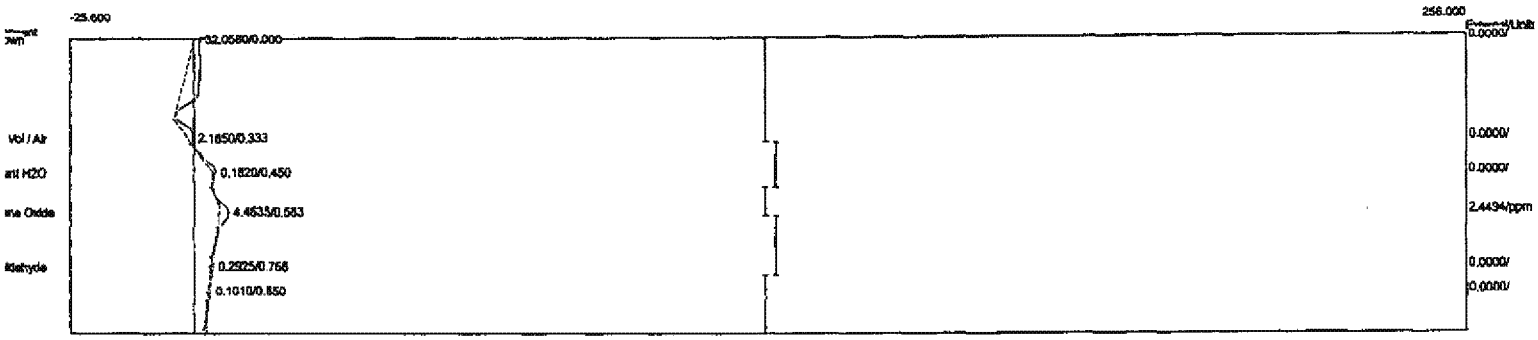
Component	Retention	Area	External	Units
ad Vol / Air	0.066	26.9190	0.0000	
ibient H2O	0.433	137.9970	0.0000	
		164.9160	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Exh
nalysis date: 12/13/2016 12:53:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1E03.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



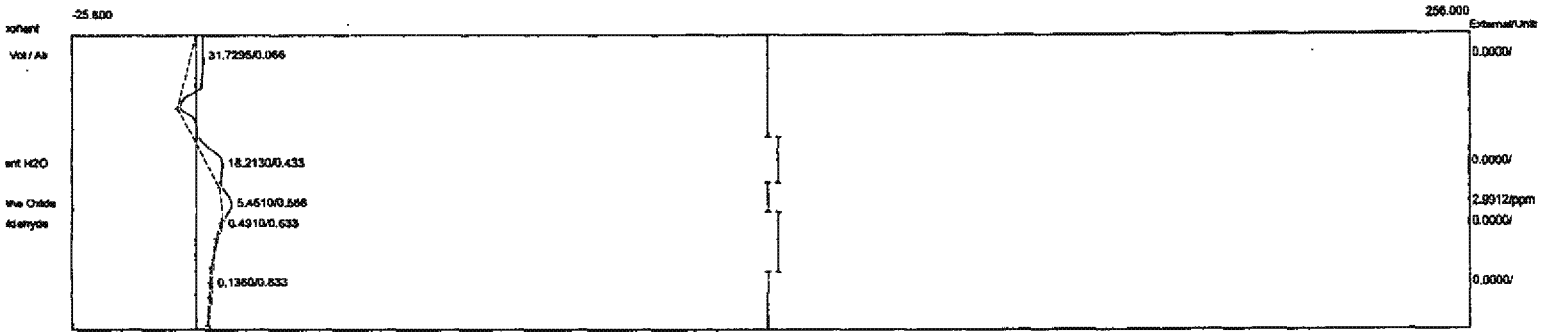
Component	Retention	Area	External	Units
ıbient H2O	0.433	20.4230	0.0000	
ıylene Oxide	0.566	3.3910	1.8608	ppm
etaldehyde	0.700	1.0045	0.0000	
		24.8185	1.8608	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Exh
ıalysis date: 12/13/2016 12:54:27
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-1E04.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



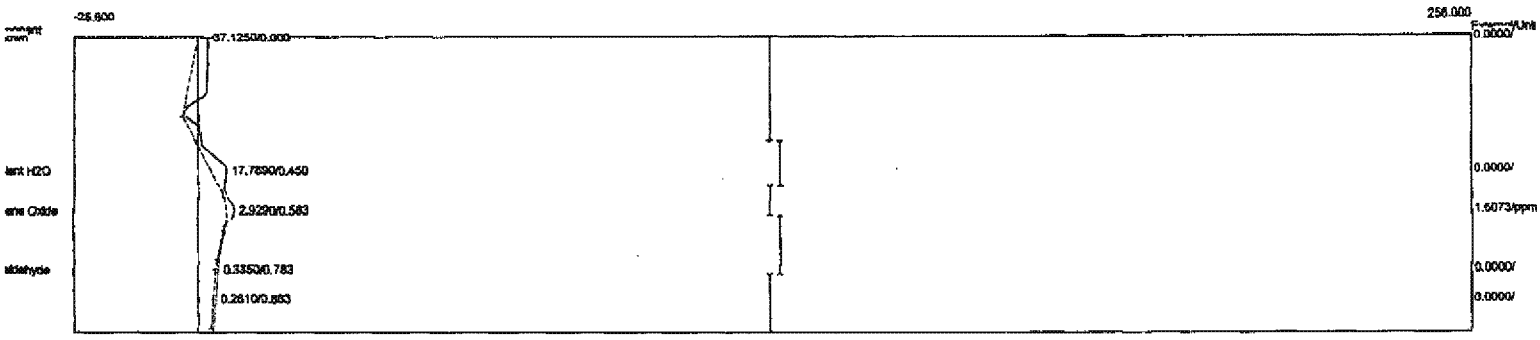
Component	Retention	Area	External	Units
ad Vol / Air	0.333	2.1650	0.0000	
ıbient H2O	0.450	0.1820	0.0000	
ıylene Oxide	0.583	4.4635	2.4494	ppm
etaldehyde	0.766	0.2925	0.0000	
›2	0.850	0.1010	0.0000	
		7.2040	2.4494	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Exh
nalysis date: 12/13/2016 12:55:46
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-1E05.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



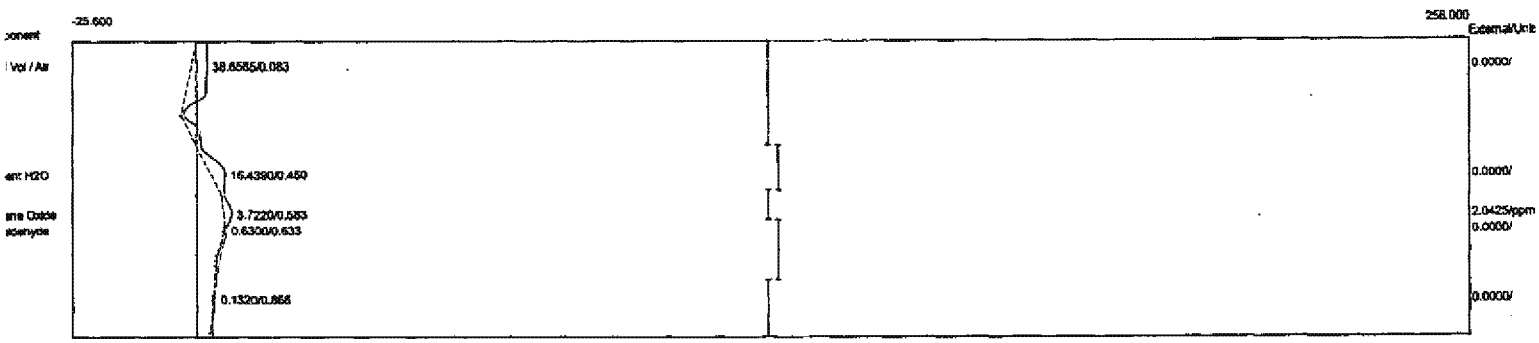
Component	Retention	Area	External	Units
ad Vol / Air	0.066	31.7295	0.0000	
ıbient H2O	0.433	18.2130	0.0000	
ıylene Oxide	0.566	5.4510	2.9912	ppm
etaldehyde	0.633	0.4910	0.0000	
›2	0.833	0.1360	0.0000	
		56.0205	2.9912	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Exh
nalysis date: 12/13/2016 12:56:59
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1E06.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



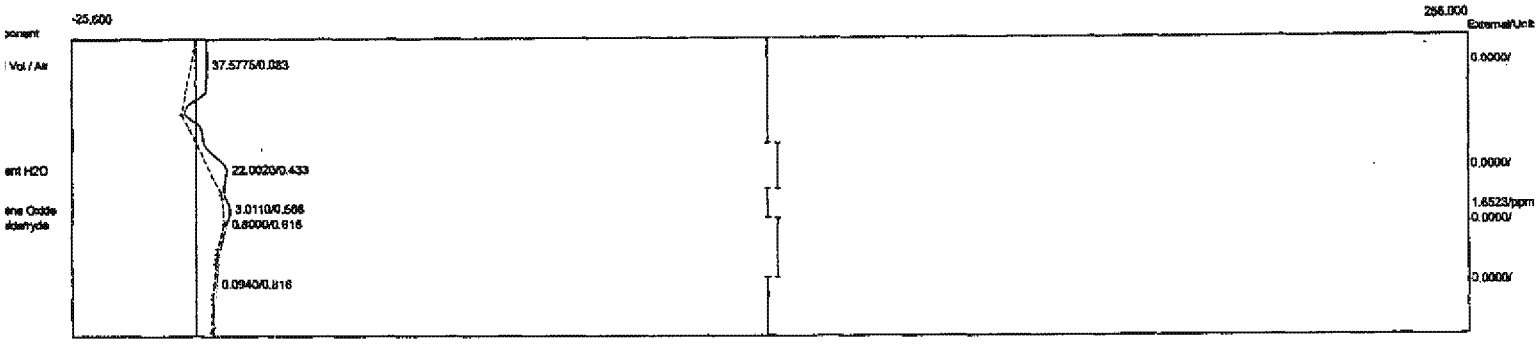
Component	Retention	Area	External	Units
ıbient H2O	0.450	17.7890	0.0000	
ıylene Oxide	0.583	2.9290	1.6073	ppm
etaldehyde	0.783	0.3350	0.0000	
)2	0.883	0.2610	0.0000	
		21.3140	1.6073	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Exh
nalysis date: 12/13/2016 12:58:16
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster2WB2016-1E07.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



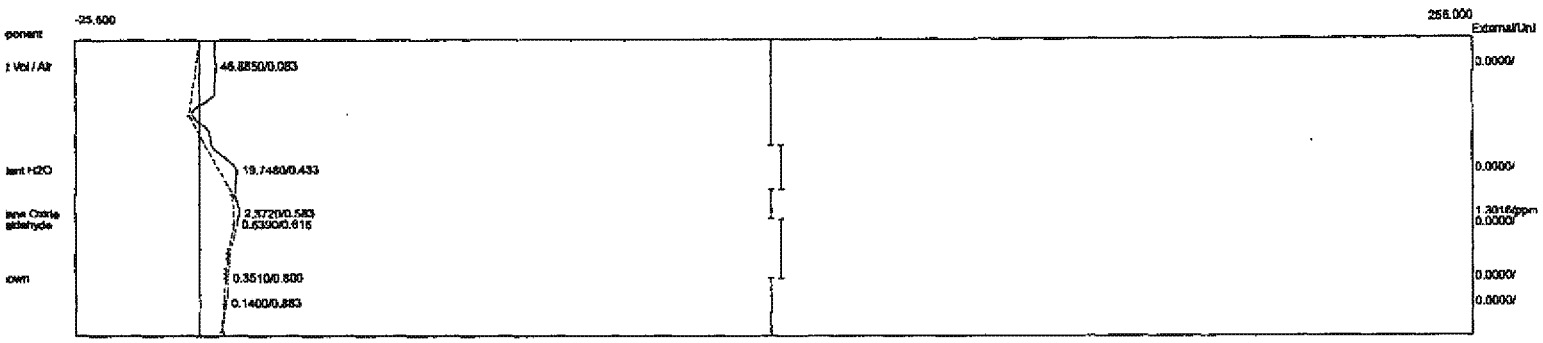
Component	Retention	Area	External	Units
ad Vol / Air	0.083	38.6585	0.0000	
ıbient H2O	0.450	16.4390	0.0000	
ıylene Oxide	0.583	3.7220	2.0425	ppm
etaldehyde	0.633	0.6300	0.0000	
)2	0.866	0.1320	0.0000	
		59.5815	2.0425	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Exh
nalysis date: 12/13/2016 12:59:38
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster2WB2016-1E08.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.083	37.5775	0.0000	
ıbient H2O	0.433	22.0020	0.0000	
ıylene Oxide	0.566	3.0110	1.6523	ppm
etaldehyde	0.616	0.8000	0.0000	
)2	0.816	0.0940	0.0000	
		63.4845	1.6523	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Exh
nalysis date: 12/13/2016 13:00:50
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1E09.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer

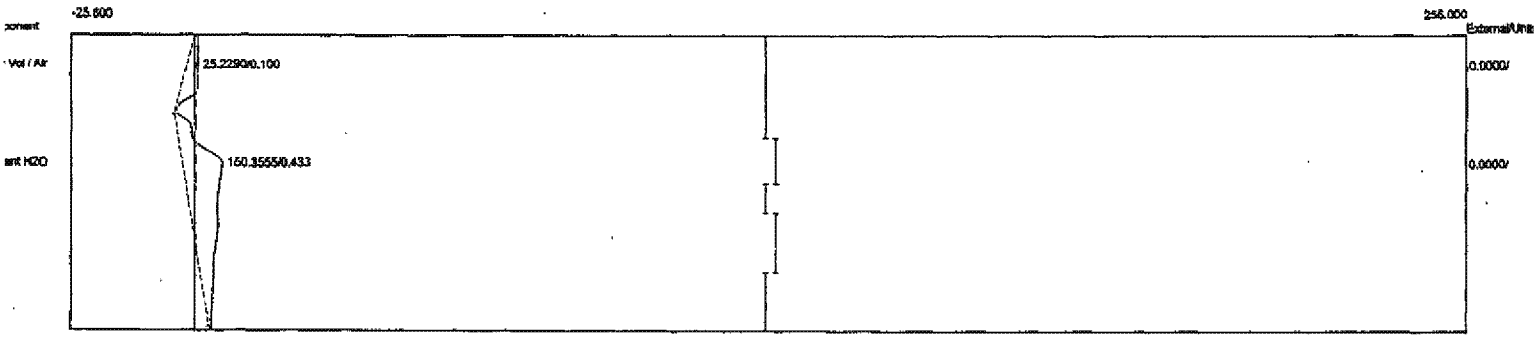


Component	Retention	Area	External	Units
ead Vol / Air	0.083	46.8850	0.0000	
nbient H2O	0.433	19.7480	0.0000	
ylene Oxide	0.583	2.3720	1.3016	ppm
etaldehyde	0.616	0.6390	0.0000	
)2	0.883	0.1400	0.0000	
		69.7840	1.3016	

APPENDIX F

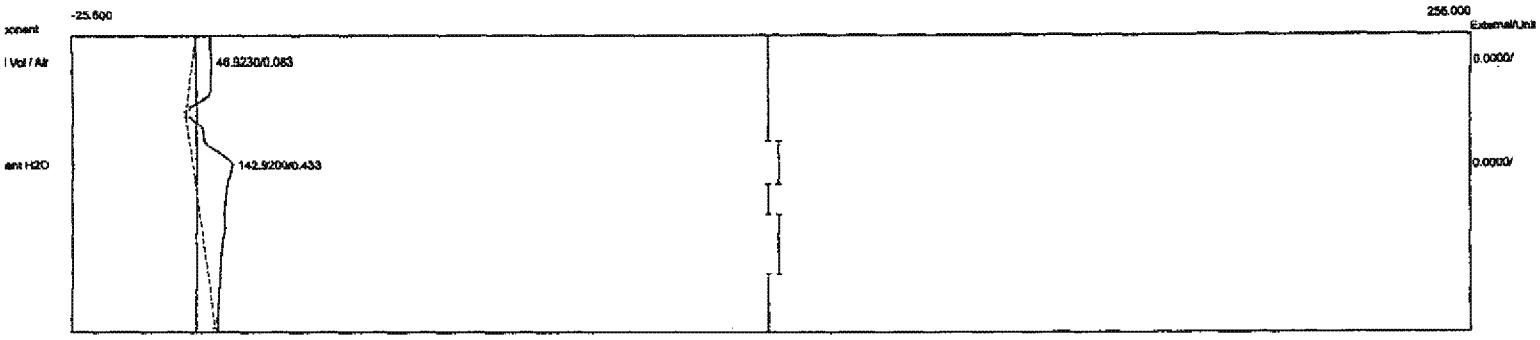
Run#2 Chromatograms - Exhaust

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Exh
nalysis date: 12/13/2016 17:07:23
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster2WB2016-2E01.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



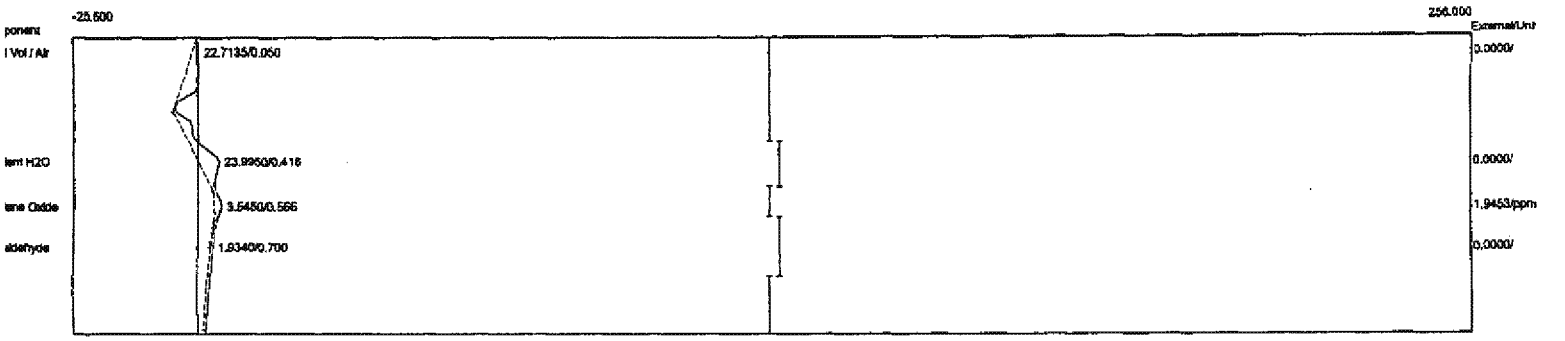
Component	Retention	Area	External	Units
ad Vol / Air	0.100	25.2290	0.0000	
ıbient H2O	0.433	150.3555	0.0000	
		175.5845	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Exh
nalysis date: 12/13/2016 17:08:31
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100:tem
:omponents: eto2-100.cpt
Data file: 2Ster2WB2016-2E02.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



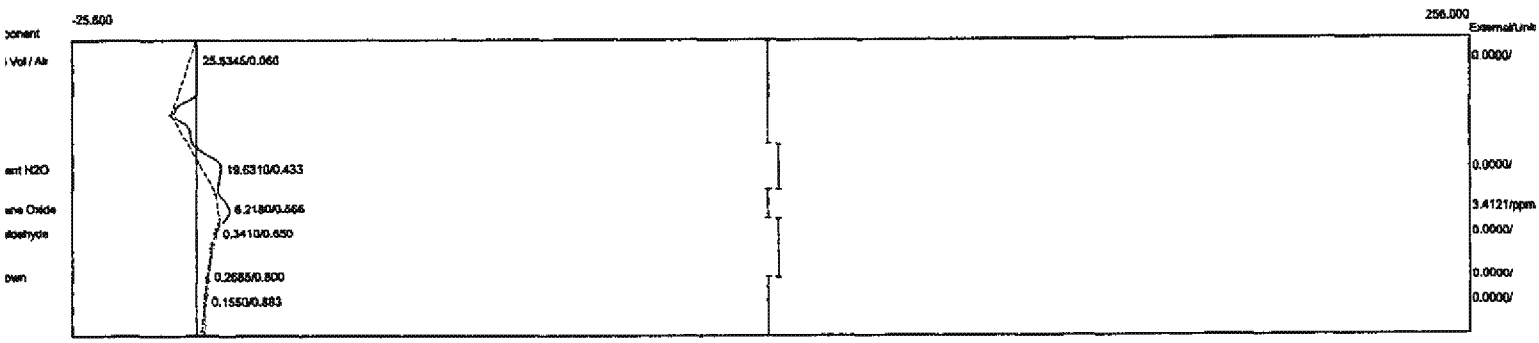
Component	Retention	Area	External	Units
ad Vol / Air	0.083	46.9230	0.0000	
ıbient H2O	0.433	142.9200	0.0000	
		189.8430	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Exh
nalysis date: 12/13/2016 17:09:39
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2E03.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



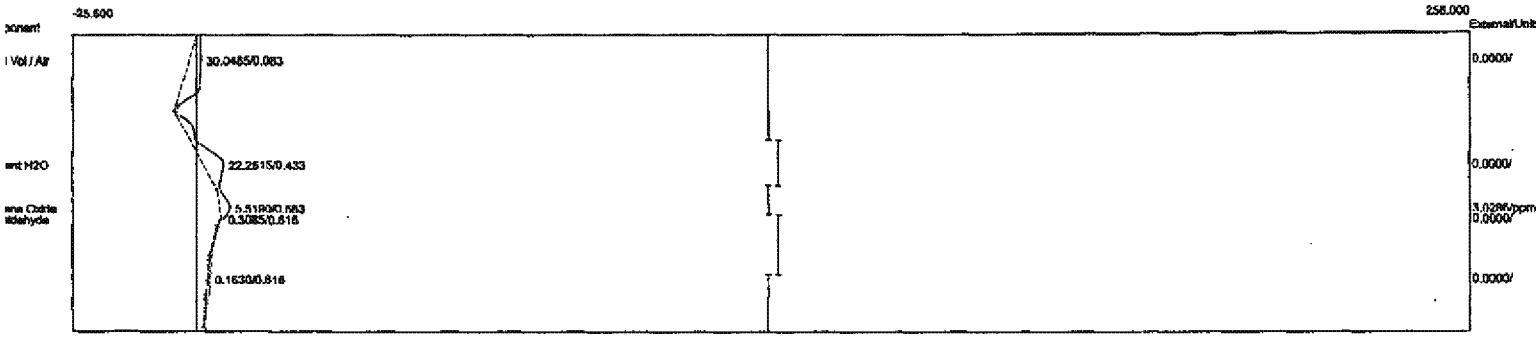
Component	Retention	Area	External	Units
ead Vol / Air	0.050	22.7135	0.0000	
nbient H2O	0.416	23.9950	0.0000	
ylene Oxide	0.566	3.5450	1.9453	ppm
etaldehyde	0.700	1.9340	0.0000	
		52.1875	1.9453	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Exh
nalysis date: 12/13/2016 17:11:02
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-2E04.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



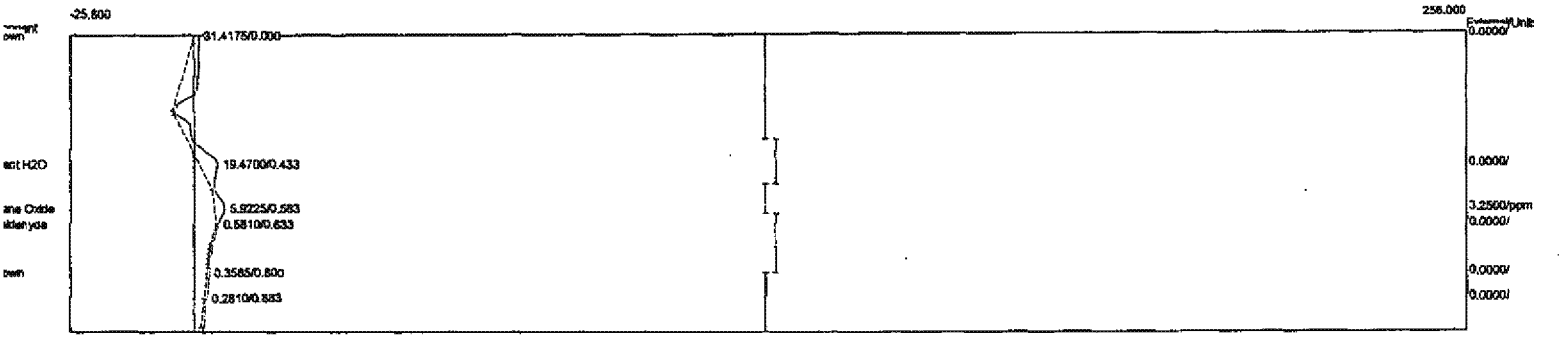
Component	Retention	Area	External	Units
ad Vol / Air	0.066	25.5345	0.0000	
ıbient H2O	0.433	19.6310	0.0000	
ıylene Oxide	0.566	6.2180	3.4121	ppm
etaldehyde	0.650	0.3410	0.0000	
)2	0.883	0.1550	0.0000	
		51.8795	3.4121	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Exh
nalysis date: 12/13/2016 17:12:13
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-2E05.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



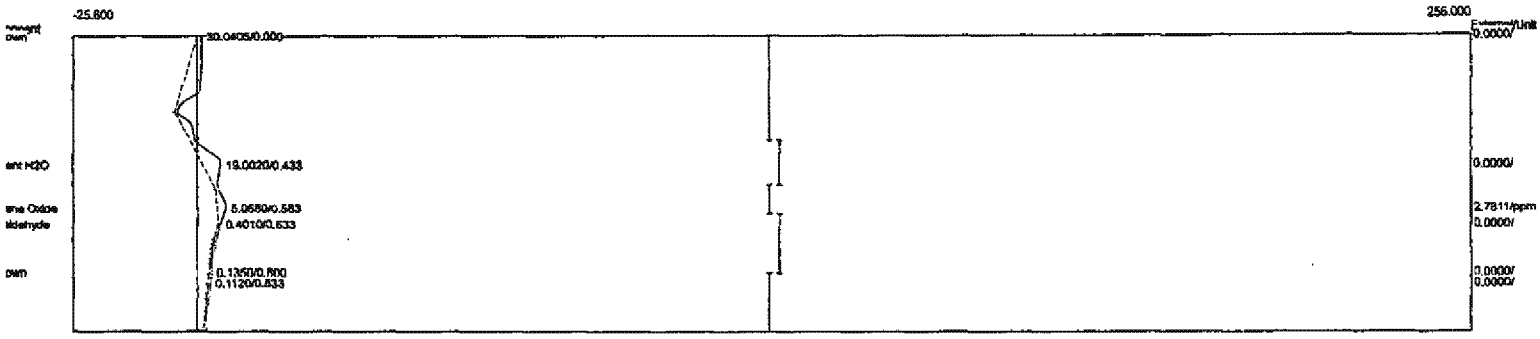
Component	Retention	Area	External	Units
ad Vol / Air	0.083	30.0485	0.0000	
ıbient H2O	0.433	22.2615	0.0000	
ıylene Oxide	0.583	5.5190	3.0286	ppm
etaldehyde	0.616	0.3085	0.0000	
)2	0.816	0.1630	0.0000	
		58.3005	3.0286	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Exh
ıalysis date: 12/13/2016 17:13:23
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
'omponents: eto2-100.cpt
Data file: 2Ster2WB2016-2E06.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



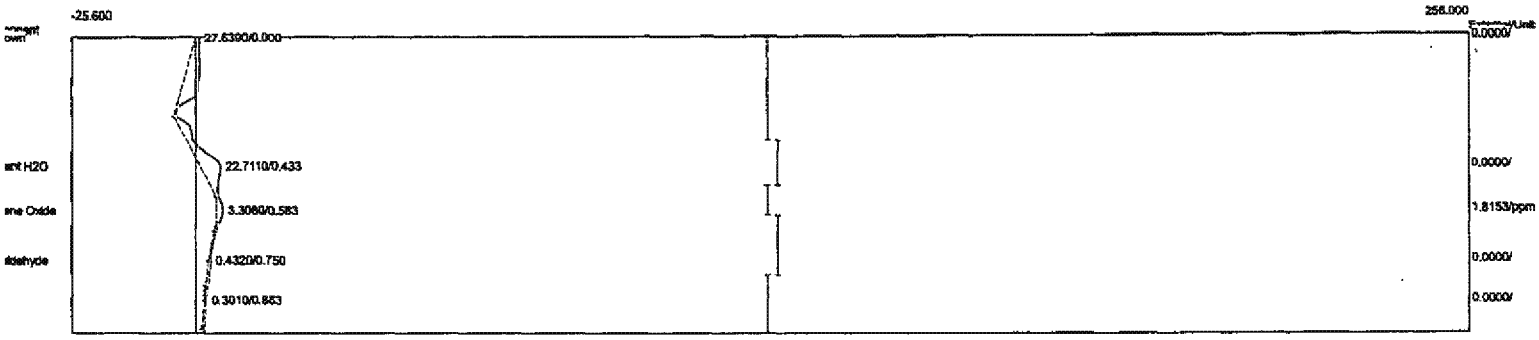
Component	Retention	Area	External	Units
ıbient H2O	0.433	19.4700	0.0000	
ıylene Oxide	0.583	5.9225	3.2500	ppm
etaldehyde	0.633	0.5810	0.0000	
)2	0.883	0.2810	0.0000	
		26.2545	3.2500	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Exh
nalysis date: 12/13/2016 17:14:37
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
'omponents: eto2-100.cpt
Data file: 2Ster2WB2016-2E07.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



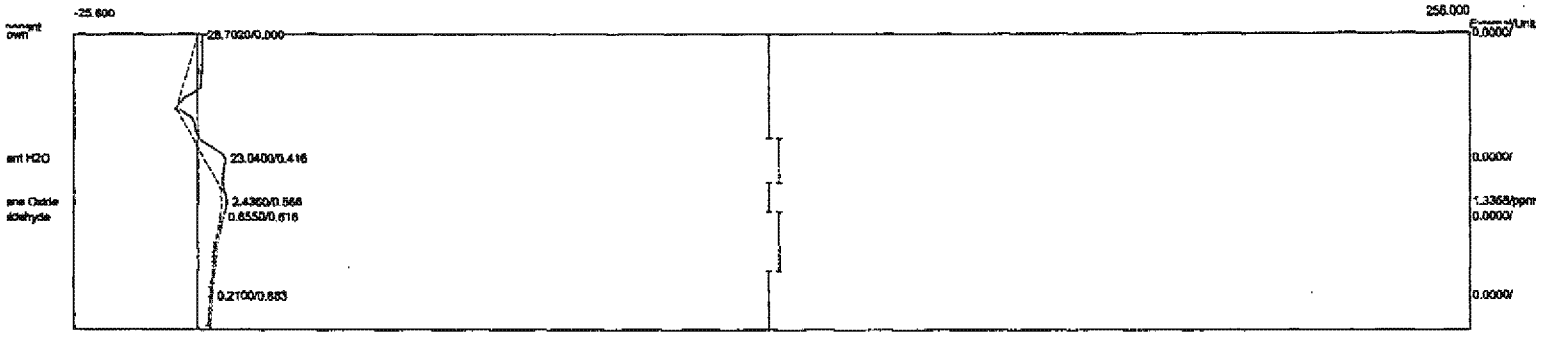
Component	Retention	Area	External	Units
ıbient H2O	0.433	19.0020	0.0000	
ıylene Oxide	0.583	5.0680	2.7811	ppm
etaldehyde	0.633	0.4010	0.0000	
)2	0.833	0.1120	0.0000	
		24.5830	2.7811	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Exh
nalysis date: 12/13/2016 17:15:52
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster2WB2016-2E08.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ıbient H2O	0.433	22.7110	0.0000	
ıylene Oxide	0.583	3.3080	1.8153	ppm
etaldehyde	0.750	0.4320	0.0000	
)2	0.883	0.3010	0.0000	
		26.7520	1.8153	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Exh
nalysis date: 12/13/2016 17:17:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2E09.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer

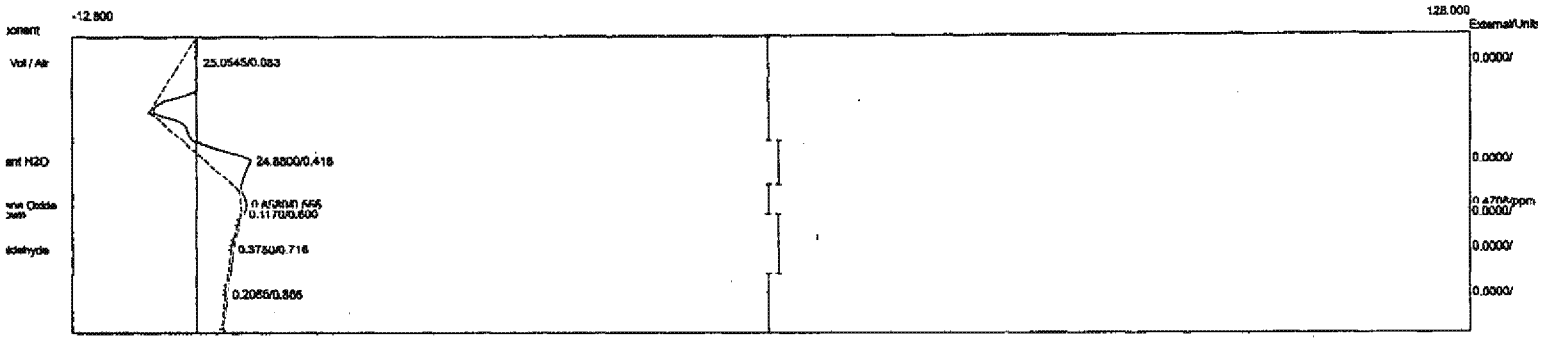


Component	Retention	Area	External	Units
ıbient H2O	0.416	23.0400	0.0000	
ıylene Oxide	0.566	2.4360	1.3368	ppm
etaldehyde	0.616	0.6550	0.0000	
)2	0.883	0.2100	0.0000	
		26.3410	1.3368	

APPENDIX G

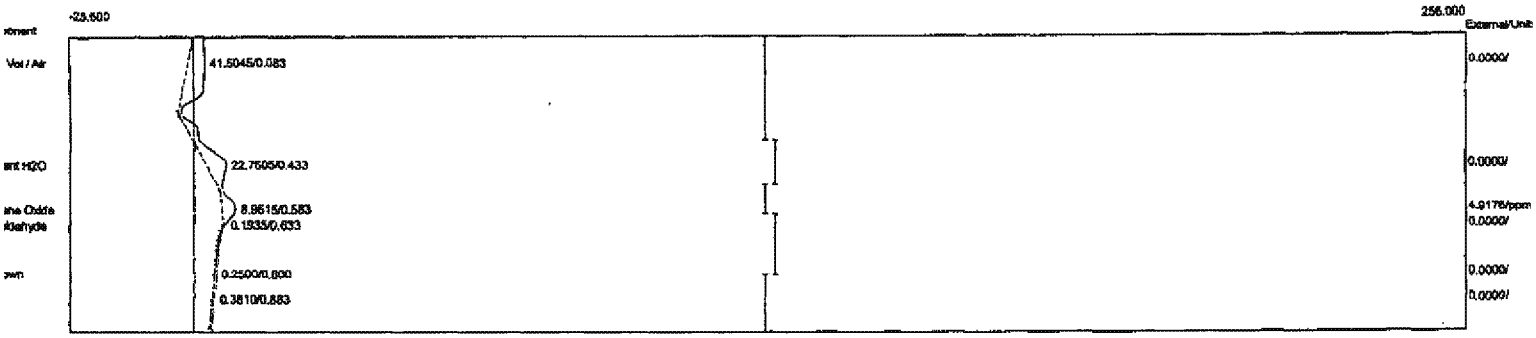
Run#3 Chromatograms - Exhaust

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Exh
nalysis date: 12/13/2016 17:23:03
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-3E01.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



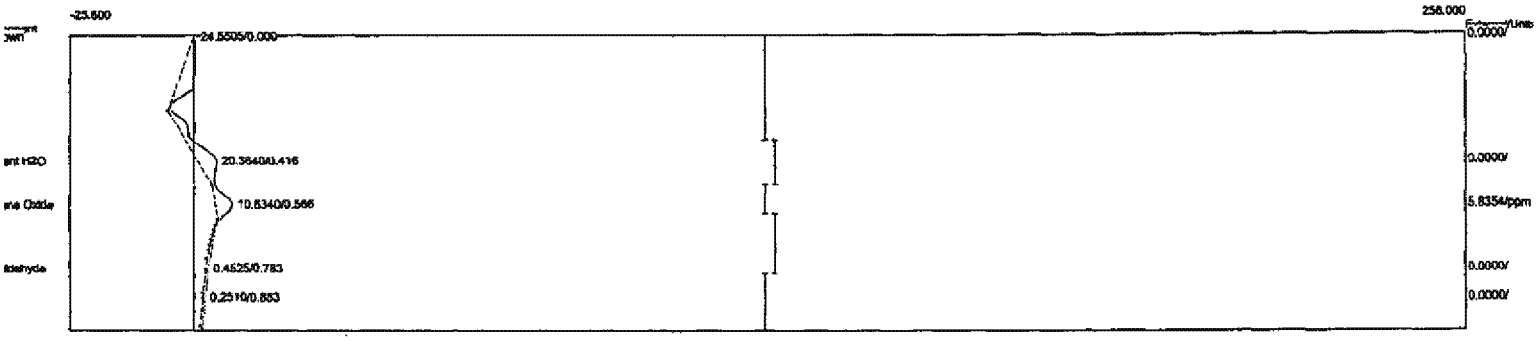
Component	Retention	Area	External	Units
ad Vol / Air	0.083	25.0545	0.0000	
ıbient H2O	0.416	24.8800	0.0000	
ıylene Oxide	0.566	0.8580	0.4708	ppm
etaldehyde	0.716	0.3750	0.0000	
)2	0.866	0.2085	0.0000	
		51.3760	0.4708	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Exh
nalysis date: 12/13/2016 17:24:17
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-3E02.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



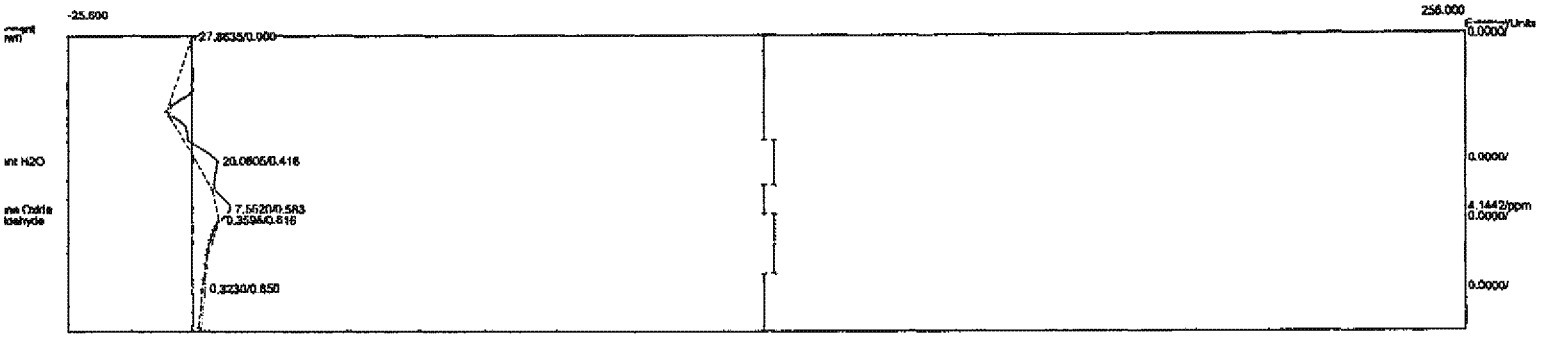
Component	Retention	Area	External	Units
ad Vol / Air	0.083	41.5045	0.0000	
ıbient H2O	0.433	22.7605	0.0000	
ıylene Oxide	0.583	8.9615	4.9176	ppm
etaldehyde	0.633	0.1935	0.0000	
)2	0.883	0.3810	0.0000	
		73.8010	4.9176	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Exh
nalysis date: 12/13/2016 17:25:30
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster2WB2016-3E03.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



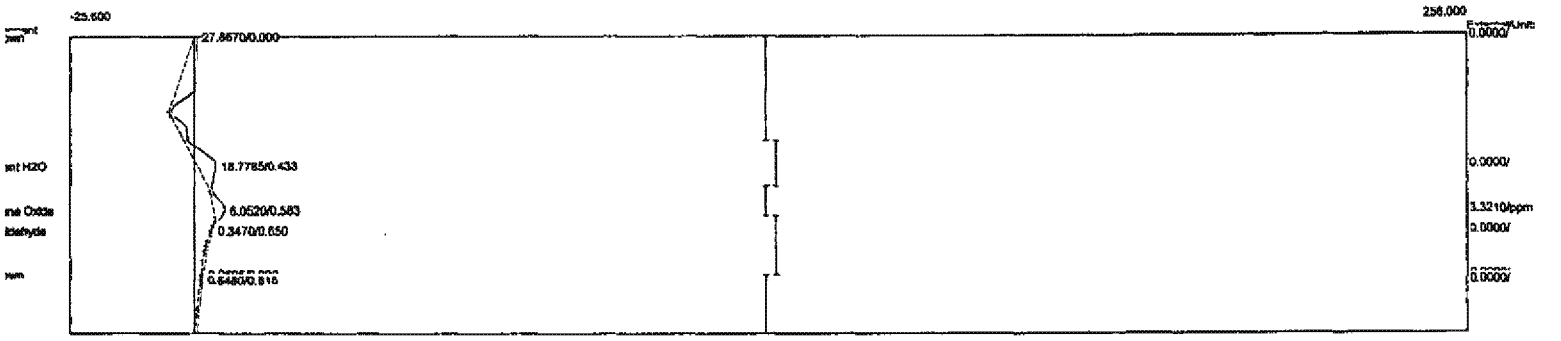
Component	Retention	Area	External	Units
ıbient H2O	0.416	20.3640	0.0000	
ıylene Oxide	0.566	10.6340	5.8354	ppm
ɜtaldehyde	0.783	0.4525	0.0000	
›2	0.883	0.2510	0.0000	
		31.7015	5.8354	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Exh
ıalysis date: 12/13/2016 17:26:47
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-3E04.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



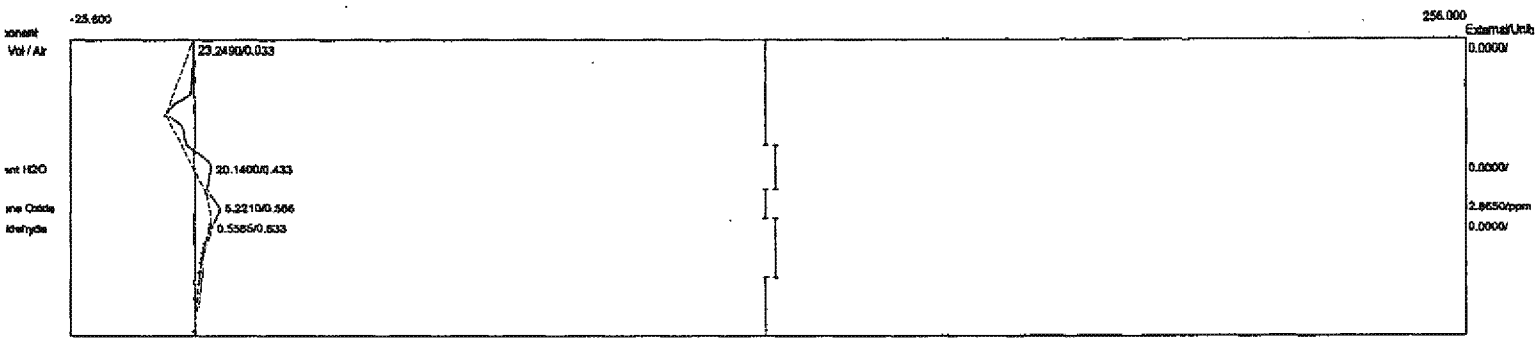
Component	Retention	Area	External	Units
bient H2O	0.416	20.0605	0.0000	
ylene Oxide	0.583	7.5520	4.1442	ppm
ɜtaldehyde	0.616	0.3595	0.0000	
2	0.850	0.3230	0.0000	
		28.2950	4.1442	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Exh
nalysis date: 12/13/2016 17:28:00
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-3E05.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



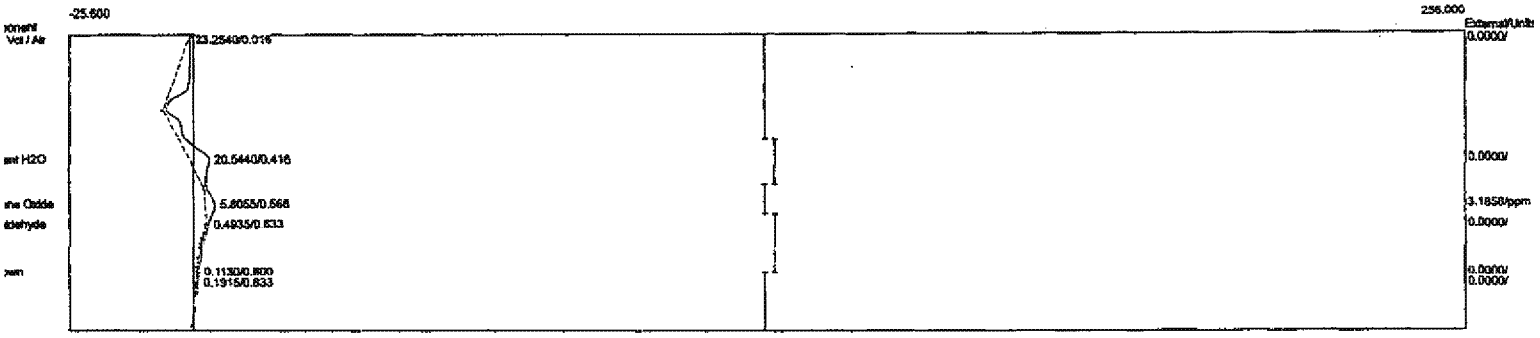
Component	Retention	Area	External	Units
ıbient H2O	0.433	18.7785	0.0000	
ıylene Oxide	0.583	6.0520	3.3210	ppm
ɜtaldehyde	0.650	0.3470	0.0000	
)2	0.816	0.6480	0.0000	
		25.8255	3.3210	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Exh
nalysis date: 12/13/2016 17:29:10
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-3E06.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.033	23.2490	0.0000	
ıbient H2O	0.433	20.1400	0.0000	
ıylene Oxide	0.566	5.2210	2.8650	ppm
etaldehyde	0.633	0.5585	0.0000	
		49.1685	2.8650	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Exh
ıalysis date: 12/13/2016 17:30:24
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-3E07.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.016	23.2540	0.0000	
ıbient H2O	0.416	20.5440	0.0000	
ıylene Oxide	0.566	5.8055	3.1858	ppm
etaldehyde	0.633	0.4935	0.0000	
ı2	0.833	0.1915	0.0000	
		50.2885	3.1858	

APPENDIX H

Field Data and Calculation Worksheets

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Sterigenics, Inc. - Willowbrook, IL (Plant 2)
12/13/16 - Aeration Runs 1-3

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
	Run #1		
0.15	0.3873	74	0.01
0.15	0.3873	74	0.01
0.15	0.3873	74	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
	Run #2		
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	74	0.01
0.15	0.3873	74	0.01
0.15	0.3873	74	0.01
0.15	0.3873	74	0.01
0.15	0.3873	74	0.01
	Run #3		
0.15	0.3873	76	0.01
0.15	0.3873	76	0.01
0.15	0.3873	76	0.01
0.15	0.3873	76	0.01
0.15	0.3873	76	0.01
0.15	0.3873	76	0.01
0.15	0.3873	76	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
Average =			
0.15	0.3873	75.0	**0.0100**
	=	535	degR

mw =	28.51	
stack ID =	36	in.
stack area =	7.069	sq. ft.
press =	29.20	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	26.3	ft/sec
Flow =	**10412**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.000012**	**lbs/min**
EtO Mass Flow =	**0.000714**	**lbs/hr**

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Run #1 - Exhaust Phase - Chamber K
AAT Safe Cell System - Dry Bed Outlet
Sterigenics EO, Inc. - Willowbrook, IL (Plant 2)
December 13, 2016

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.15	0.3873	74	0.01
0.15	0.3873	74	0.01
0.15	0.3873	74	1.86
0.15	0.3873	75	2.45
0.15	0.3873	75	2.99
0.15	0.3873	75	1.61
0.15	0.3873	75	2.04
0.15	0.3873	75	1.65
0.15	0.3873	75	1.30
Average = 0.1500	0.3873	75	**1.547**
	=	535	degR

stack ID =	36	in.
stack area =	7.069	sq. ft.
press =	29.20	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	26.27	ft/sec
Flow =	**10415**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0018416**	**lbs/min**
evac start =	1249	
evac stop =	1301	
min/cycle =	12	
Outlet EtO Emissions =	**0.02210**	**lbs/cycle**

INLET CALCULATION:

Pre-Evac:				Post-Evac:			
	V =	1332	ft3		V =	1332	ft3
	P =	14.5	in Hg Abs		P =	3.0	in Hg Abs
	T =	125	degF		T =	125	degF
	R =	10.73			R =	10.73	
	mw =	44.05			mw =	44.05	
	lbs EtO @ 100% =	66.44	lbs		lbs EtO @ 100% =	13.75	lbs

Initial EtO = Scale Wt. =	60	lbs
% EtO @ Chamber = Scale Wt. / lbs EtO @ 100% (Pre) =	90.3	%
Final EtO = % EtO @ Chamber X lbs EtO @ 100% (Post) =	12.41	lbs
INLET ETO = Initial EtO - Final EtO =	**47.6**	**lbs**
Inlet EtO (from Aeration) =	2.215	lbs
TOTAL INLET ETO =	**49.801**	**lbs**
CONTROL EFFICIENCY =	**99.9556**	**%**

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Run #2 - Exhaust Phase - Chamber K
AAT Safe Cell System - Dry Bed Outlet
Sterigenics, Inc. - Willowbrook, IL (Plant 2)
December 13, 2016

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	1.95
0.15	0.3873	75	3.41
0.15	0.3873	75	3.03
0.15	0.3873	75	3.25
0.15	0.3873	76	2.78
0.15	0.3873	75	1.82
0.15	0.3873	75	1.34
Average =			
0.1500	0.3873	75	**1.956**
	=	535	degR

stack ID =	36	in.
stack area =	7.069	sq. ft.
press =	29.20	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	26.28	ft/sec
Flow =	**10411**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0023275**	**lbs/min**
evac start =	1707	
evac stop =	1718	
min/cycle =	11	
Outlet EtO Emissions =	**0.02560**	**lbs/cycle**

INLET CALCULATION:

Pre-Evac:				Post-Evac:			
	V =	1332	ft3		V =	1332	ft3
	P =	14.5	in Hg Abs		P =	3.0	in Hg Abs
	T =	126	degF		T =	124	degF
	R =	10.73			R =	10.73	
	mw =	44.05			mw =	44.05	
	lbs EtO @ 100% =	66.33	lbs		lbs EtO @ 100% =	13.77	lbs

Initial EtO = Scale Wt. =	60	lbs
% EtO @ Chamber = Scale Wt. / lbs EtO @ 100% (Pre) =	90.5	%
Final EtO = % EtO @ Chamber X lbs EtO @ 100% (Post) =	12.46	lbs
INLET ETO = Initial EtO - Final EtO =	**47.5**	**lbs**
Inlet EtO (from Aeration) =	2.215	lbs
TOTAL INLET ETO =	**49.759**	**lbs**
CONTROL EFFICIENCY =	**99.9485**	**%**

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Run #3 - Exhaust Phase - Chamber G
AAT Safe Cell System - Dry Bed Outlet
Sterigenics, Inc. - Willowbrook, IL (Plant 2)
December 13, 2016

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.15	0.3873	75	0.47
0.15	0.3873	75	4.92
0.15	0.3873	75	5.84
0.15	0.3873	75	4.14
0.15	0.3873	75	3.32
0.15	0.3873	75	2.87
0.15	0.3873	76	3.19
Average =			
0.1500	0.3873	75	**3.536**
	=	535	degR

stack ID =	36	in.
stack area =	7.069	sq. ft.
press =	29.20	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	26.28	ft/sec
Flow =	**10411**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0042081**	**lbs/min**
evac start =	1722	
evac stop =	1731	
min/cycle =	9	
Outlet EtO Emissions =	**0.03787**	**lbs/cycle**

INLET CALCULATION:

Pre-Evac:				Post-Evac:			
	V =	1332	ft3		V =	1332	ft3
	P =	14.4	in Hg Abs		P =	3.0	in Hg Abs
	T =	125	degF		T =	125	degF
	R =	10.73			R =	10.73	
	mw =	44.05			mw =	44.05	
	lbs EtO @ 100% =	65.98	lbs		lbs EtO @ 100% =	13.75	lbs

Initial EtO = Scale Wt. =	59	lbs
% EtO @ Chamber = Scale Wt. / lbs EtO @ 100% (Pre) =	89.4	%
Final EtO = % EtO @ Chamber X lbs EtO @ 100% (Post) =	12.29	lbs
INLET ETO = Initial EtO - Final EtO =	**46.7**	**lbs**
Inlet EtO (from Aeration) =	2.215	lbs
TOTAL INLET ETO =	**48.923**	**lbs**
CONTROL EFFICIENCY =	**99.9226**	**%**

APPENDIX I

Gas Certifications

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

300 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-001
Item No.: 02020001310TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CAL4448
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	1.10	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: MT

DATE: 4-18-16

ED_002192_00004255-00192

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	1.	PPM	1.10	PPM	10.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1300 PSIG
Expiration Date: 18Apr2018

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

00 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-003
Item No.: 02020001320TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM003232
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	10.1	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: MT
MT

DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	10.	PPM	10.1	PPM	1.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1400 PSIG
Expiration Date: 18Apr2018

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

500 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-004
Item No.: 02020001330TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM011385
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	100.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully BLM DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	100.	PPM	100.	PPM	.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1400 PSIG
Expiration Date: 18Apr2018

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

500 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-005
Item No.: 02020001340TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM002810
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	1,000.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully
BLM

DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	1,000.	PPM	1,000.	PPM	.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1300 PSIG
Expiration Date: 18Apr2018

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

800 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-006
Item No.: 02020001340TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM005787
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	10,080.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully
BLM

DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	10,000.	PPM	10,080.	PPM	.8	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 800 PSIG
Expiration Date: 18Apr2018

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFICATE OF ANALYSIS

Customer Name:	ECSi, Inc.	**Cylinder Number:**	SA25925
Stock or Analyzer Tag Number:	N/A	**Product Class:**	Certified Standard
Customer Reference:	Verbal- Dan	**Cylinder - Contents[1]:**	28 CF @ 2000 PSI
MESA Reference:	104448	**Cylinder-CGA:**	A006-HP-BR/350
Date of Certification:	4/20/2016	**Analysis Method:**	GC-TCD/FID
Recommended Shelf Life:	2 Years	**Preparation Method:**	Gravimetric

Component	Requested Concentration[2]	Reported Concentration[2,3]
Ethylene Oxide	50 ppm	48.8 ppm
Nitrogen	Balance	Balance

Authorized Signature:

1. The fill pressure shown on the COA is as originally quoted. The fill pressure measured by the customer may differ from the fill pressure originally quoted due to temperature effects, compressibility of the individual components when blended together in the cylinder, gauge accuracy or reduction in content volume before shipping as a result of samples withdrawn for laboratory QC necessary to ensure product quality.
2. Unless otherwise stated, concentrations are given in molar units.
3. Vapor pressure mixes are blended at a sufficiently low pressure so as to eliminate phase separation under most low temperature conditions encountered during transport or storage. However, it is generally recommended that cylinders containing vapor pressure restricted mixes be placed on the floor in a horizontal position and rolled back and forth to improve homogeneity of the gas phase mixture before being put into service.

Analytical Gas Standards are prepared and analyzed using combinations of NIST traceable weights, SRM's provided by NIST, or internal gas standards that have been verified for accuracy using procedures published by the US-EPA. Pure gases are analyzed and certified for purity using minor component Analytical Gas Standards prepared according to the methods specified above. Balances are calibrated to NIST test weights covered by NIST test number 822/256175/96. Reference Certification #'s: 163/W, 830/N and 3280. Calibration methods are in conformance with MIL-STD 45662A.

MESA Specialty Gases & Equipment
division of MESA International Technologies, Inc.
3619 Pendleton Avenue, Suite C ♦ Santa Ana, California 92704 ♦ USA
TEL: 714-434-7102 ♦ FAX: 714-434-8006 ♦ E-mail: mail@mesagas.com
On-line Catalog at www.mesagas.com

APPENDIX J

Process Data

Process Run Record

Sterigenics International, Inc.
7775 S. Quincy Street
Willowbrook, IL 60527
Tel: +1 (630) 654-5151

Run ID:	**304145**	Pallet Count:	**0**	Equipment:	**Chamber G**
Customer:	**Sterigenics International**			Workorder Num:	**1860461**
Specification:	**17.1**	Checksum:	**-24959**	Cycle:	**Antares Cycle 751/CV 22130**
Description:	**ENG #9-12DEC2016**				
Date Started:	**13-Dec-16 21:38:07**			Date Completed:	
Date Aborted:	**13-Dec-16 23:22:04**	**Aborted!**		Aborted By:	**Ray Cruz**
Additional Info:	**TEST**				

1. Phase » General Configuration

(Phase No.0)

Date / Time	
13-Dec-16	
21:38:07	
SYS	Run ID 304145 has started

2. Phase » Start-up Phase

(Phase No.1)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure
13-Dec-16		
21:38:08	122.5	29.4
21:39:28	123.0	29.3
21:39:33	123.1	29.3

3. Phase » Vacuum

(Phase No.2)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure
13-Dec-16		
21:39:33	123.1	29.3
21:40:34	123.4	26.6
21:41:34	123.8	24.6
21:42:34	124.1	22.6
21:43:34	124.3	20.4
21:44:34	124.5	18.2
21:45:34	124.7	16.3
21:46:34	124.9	14.5
21:47:34	125.1	12.7
21:48:34	125.3	11.0
21:49:34	125.4	9.3
21:50:34	125.5	7.5
21:51:34	125.6	6.0

...

9. Phase » EO Inject by Pressure

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure	[mg/l] AT-EO	[lbs] EO Weight Used
13-Dec-16				
23:05:25	125.0	7.3	277.6	25
23:06:25	125.1	8.4	342.1	30
23:07:25	125.1	9.4	409.3	35
23:08:25	125.2	10.4	471.2	40
23:09:25	125.3	11.4	533.3	45
23:10:25	125.3	12.4	596.5	49
23:11:25	125.4	13.4	660.1	54
23:12:25	125.5	14.4	724.0	59
23:12:25	125.5	14.4	724.7	59
23:12:30	125.5	14.5	732.8	59

Step Gas Usage

ID	Gas	Drum S/N	Lot Number	Usage Value
513	EO	E000230	UTLX902730L16	59lbs

Device	Summary	Summary Value		Specified Range
Current Phase Time	Final	00:12:06		00:06:27 - 00:25:48
Elapsed Phase Time	Final	00:12:06		n/a - N/A
TempAve	Min	124.7	°F	120.0 - 130.0 °F
TempAve	Max	125.5	°F	120.0 - 130.0 °F
PCurr	Final	14.5	inHg	13.9 - 15.9 inHg
PCurr	Final	14.5	inHg	n/a - 14.9 inHg
AT-EO	Final	732.8	mg/l	N/A - N/A mg/l
EO Weight Used	Final	59	lbs	N/A - N/A lbs

10. Phase » EO Dwell

(Phase No.7)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure	[mg/l] AT-EO	[lbs] EO Weight Used	[mg/l] AT-AH	[%] RH Sensor
13-Dec-16						
23:12:30	125.5	14.5	733.2	0	15.1	N/A
23:13:31	125.5	14.4	768.6	0	15.6	N/A
23:14:31	125.5	14.4	770.8	0	15.1	N/A
23:15:31	125.5	14.4	772.9	0	16.0	N/A
23:16:31	125.5	14.4	773.2	0	15.6	N/A
23:17:31	125.5	14.4	773.1	0	16.0	N/A
23:18:31	125.5	14.4	773.2	0	16.5	N/A
23:19:31	125.5	14.4	773.1	0	16.5	N/A
23:20:31	125.4	14.4	773.1	0	16.3	N/A
23:21:31	125.3	14.4	773.1	0	16.9	N/A
23:22:04	125.3	14.4	775.4	0	16.5	N/A
OPR Operator has requested abort						
23:22:04	125.3	14.4	775.4	0	16.5	N/A
DVN Current Phase Time has a measurement value of 00:09:34. The min specified value is 00:59:00						

...

10. Phase » EO Dwell

Device	Summary	Summary Value		Specified Range
Current Phase Time	Final	00:09:34		00:59:00 - 05:00:00
Elapsed Phase Time	Final	00:09:34		n/a - N/A
TempAve	Min	125.3	°F	120.0 - 130.0 °F
TempAve	Max	125.5	°F	120.0 - 130.0 °F
PCurr	Min	14.4	inHg	14.0 - 16.0 inHg
PCurr	Min	14.4	inHg	n/a - 14.9 inHg
PCurr	Max	14.5	inHg	14.0 - 16.0 inHg
PCurr	Max	14.5	inHg	n/a - 14.9 inHg
RH from AH Calc	Min	N/A	%	N/A - N/A %
RH from AH Calc	Max	N/A	%	N/A - N/A %
AT-AH	Min	15.1	mg/l	N/A - N/A mg/l
AT-AH	Max	16.9	mg/l	N/A - N/A mg/l
AT-EO	Min	733.2	mg/l	N/A - N/A mg/l
AT-EO	Max	775.4	mg/l	N/A - N/A mg/l
EO Weight Used	Final	0	lbs	N/A - N/A lbs

DVN Current Phase Time has a measurement value of 00:09:34. The min specified value is 00:59:00

11. Phase » Vacuum

(Phase No.8)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure
13-Dec-16		
23:22:04	125.3	14.4
SYS Cycle has entered EO-Abort sequence while running Run ID 304145 at phase no. 8 - 0		
23:23:05	125.3	12.3
23:24:05	125.2	10.7
23:25:05	125.2	8.9
23:26:05	125.0	7.4
23:27:05	125.0	6.1
23:28:05	124.8	5.1
23:29:05	124.8	4.3
23:30:05	124.8	3.6
23:31:05	124.8	3.1
23:31:12	124.7	3.0
23:31:14	124.7	3.0

Device	Summary	Summary Value		Specified Range
Current Phase Time	Final	00:09:10		00:02:51 - 00:20:00
Elapsed Phase Time	Final	00:09:10		n/a - N/A
TempAve	Min	124.7	°F	120.0 - 130.0 °F
TempAve	Max	125.3	°F	120.0 - 130.0 °F
PCurr	Final	3.0	inHg	2.5 - 3.5 inHg
PCurr	Final	3.0	inHg	n/a - N/A inHg

12. Phase » Nitrogen Inject

(Phase No.9 - 1)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure	[mg/l] AT-EO

...

9. Phase » EO Inject by Pressure

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure	[mg/l] AT-EO	[lbs] EO Weight Used
13-Dec-16				
22:54:25	125.3	3.5	30.1	8
22:55:25	125.4	4.3	58.2	11
22:56:25	125.4	5.3	110.3	16
22:57:25	125.4	6.3	167.8	21
22:58:25	125.4	7.2	223.4	25
22:59:25	125.5	8.3	286.5	30
23:00:25	125.5	9.3	347.5	35
23:01:25	125.5	10.3	404.4	40
23:02:25	125.5	11.3	457.8	45
23:03:25	125.5	12.3	519.3	50
23:04:25	125.5	13.3	579.4	54
23:05:25	125.5	14.3	639.9	59
23:05:29	125.6	14.4	646.1	60
23:05:34	125.6	14.5	655.8	60

Step Gas Usage

ID	Gas	Drum S/N	Lot Number	Usage Value
511	EO	E001214	UTLX902730L16	60lbs

Device	Summary	Summary Value		Specified Range
Current Phase Time	Final	00:12:10		00:06:27 - 00:25:48
Elapsed Phase Time	Final	00:12:10		n/a - N/A
TempAve	Min	125.3	°F	120.0 - 130.0 °F
TempAve	Max	125.6	°F	120.0 - 130.0 °F
PCurr	Final	14.5	inHg	13.9 - 15.9 inHg
PCurr	Final	14.5	inHg	n/a - 14.9 inHg
AT-EO	Final	655.8	mg/l	N/A - N/A mg/l
EO Weight Used	Final	60	lbs	N/A - N/A lbs

10. Phase » EO Dwell

(Phase No.7)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure	[mg/l] AT-EO	[lbs] EO Weight Used	[mg/l] AT-AH	[%] RH Sensor
13-Dec-16						
23:05:34	125.6	14.6	656.3	0	N/A	N/A
23:06:35	125.6	14.5	672.9	0	N/A	N/A
23:06:50	125.5	14.5	672.9	0	N/A	N/A
OPR Operator has requested abort						
23:06:50	125.5	14.5	672.9	0	N/A	N/A
DVN Current Phase.Time has a measurement value of 00:01:16. The min specified value is 00:59:00						

Process Run Record

Sterigenics International, Inc.
7775 S. Quincy Street
Willowbrook, IL 60527
Tel: +1 (630) 654-5151

Run ID:	**304146**	Pallet Count:	**0**	Equipment:	**Chamber K**
Customer:	**Sterigenics International**			Workorder Num:	**1860463**
Specification:	**17.1**	Checksum:	**-24959**	Cycle:	**Antares Cycle 751/CV 22130**
Description:	**ENG #10 12DEC16**				
Date Started:	**13-Dec-16 21:25:41**			Date Completed:	
Date Aborted:	**13-Dec-16 23:06:50**	**Aborted!**		Aborted By:	**Ray Cruz**

1. Phase » General Configuration

(Phase No.0)

Date / Time	
13-Dec-16	
21:25:41	
SYSMI	Run ID 304146 has started

2. Phase » Start-up Phase

(Phase No.1)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure
13-Dec-16		
21:25:41	123.7	29.9
21:25:42	123.7	29.9
21:25:46	123.7	29.9

3. Phase » Vacuum

(Phase No.2)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure
13-Dec-16		
21:25:46	123.7	29.9
21:26:47	123.6	27.0
21:27:47	123.5	24.8
21:28:47	123.4	23.1
21:29:47	123.4	21.4
21:30:47	123.4	19.6
21:31:47	123.3	17.6
21:32:47	123.3	15.7
21:33:47	123.3	13.8
21:34:47	123.2	11.8
21:35:47	123.2	10.1
21:36:47	123.2	8.4
21:37:47	123.2	7.0
21:38:47	123.2	5.9
21:39:47	123.2	5.0

...

10. Phase » EO Dwell

Device	Summary	Summary Value		Specified Range
Current Phase Time	Final	00:01:16		00:59:00 - 05:00:00
Elapsed Phase Time	Final	00:01:17		n/a - N/A
TempAve	Min	125.5	°F	120.0 - 130.0 °F
TempAve	Max	125.6	°F	120.0 - 130.0 °F
PCurr	Min	14.5	inHg	14.0 - 16.0 inHg
PCurr	Min	14.5	inHg	n/a - 14.9 inHg
PCurr	Max	14.6	inHg	14.0 - 16.0 inHg
PCurr	Max	14.6	inHg	n/a - 14.9 inHg
RH from AH Calc	Min	N/A	%	N/A - N/A %
RH from AH Calc	Max	N/A	%	N/A - N/A %
AT-AH	Min	N/A	mg/l	N/A - N/A mg/l
AT-AH	Max	N/A	mg/l	N/A - N/A mg/l
AT-EO	Min	656.3	mg/l	N/A - N/A mg/l
AT-EO	Max	672.9	mg/l	N/A - N/A mg/l
EO Weight Used	Final	0	lbs	N/A - N/A lbs

DVN Current Phase Time has a measurement value of 00:01:16. The min specified value is 00:59:00

11. Phase » Vacuum

(Phase No.8)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure
13-Dec-16		
23:06:50	125.5	14.5
SYS Cycle has entered EO-Abort sequence while running Run ID 304146 at phase no. 8 - 0		
23:07:51	125.4	12.7
23:08:51	125.3	11.0
23:09:51	125.2	9.4
23:10:51	125.0	8.1
23:11:51	124.9	7.0
23:12:51	124.8	6.0
23:13:51	124.7	5.2
23:14:51	124.6	4.5
23:15:51	124.5	3.9
23:16:51	124.5	3.4
23:17:50	124.4	3.0
23:17:51	124.4	3.0
23:17:52	124.4	3.0

Device	Summary	Summary Value		Specified Range
Current Phase Time	Final	00:11:02		00:02:51 - 00:20:00
Elapsed Phase Time	Final	00:11:02		n/a - N/A
TempAve	Min	124.4	°F	120.0 - 130.0 °F
TempAve	Max	125.5	°F	120.0 - 130.0 °F
PCurr	Final	3.0	inHg	2.5 - 3.5 inHg
PCurr	Final	3.0	inHg	n/a - N/A inHg

12. Phase » Nitrogen Inject

(Phase No.9 - 1)

Process Run Record

Sterigenics International, Inc.
7775 S. Quincy Street
Willowbrook, IL 60527
Tel: +1 (630) 654-5151

Run ID:	**304143**	Pallet Count:	**0**	Equipment:	**Chamber K**
Customer:	**Sterigenics International**			Workorder Num:	**1860458**
Specification:	**17.1**	Checksum:	**-24959**	Cycle:	**Antares Cycle 751/CV 22130**
Description:	**ENG #8-12DEC2016**				
Date Started:	**13-Dec-16 12:43:04**			Date Completed:	
Date Aborted:	**13-Dec-16 18:49:43**	**Aborted!**		Aborted By:	**Ray Cruz**
Additional Info:	**EPA TEST**				

1. Phase » General Configuration

(Phase No.0)

Date / Time
13-Dec-16
12:43:04

2. Phase » Start-up Phase

(Phase No.1)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure
13-Dec-16		
12:43:05	124.9	29.9
12:43:09	124.9	29.9

3. Phase » Vacuum

(Phase No.2)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure
13-Dec-16		
12:43:09	124.9	29.9
12:44:10	124.8	27.0
12:45:10	124.6	24.8
12:46:10	124.5	23.2
12:47:10	124.4	21.5
12:48:10	124.4	19.6
12:49:10	124.3	17.7
12:50:10	124.2	15.7
12:51:10	124.1	13.8
12:52:10	124.0	11.8
12:53:10	124.0	10.0
12:54:10	123.9	8.4
12:55:10	123.9	7.0
12:56:10	123.9	5.9
12:57:10	123.9	5.0

ED_002192_00004255-00210

...

9. Phase » EO Inject by Pressure

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure	[mg/l] AT-EO	[lbs] EO Weight Used
13-Dec-16				
14:11:42	126.1	3.5	27.1	8
14:12:42	126.1	4.3	56.4	12
14:13:42	126.1	5.3	110.0	17
14:14:42	126.2	6.3	164.4	21
14:15:42	126.1	7.3	231.6	26
14:16:42	126.1	8.3	288.4	31
14:17:42	126.1	9.3	350.4	36
14:18:42	126.2	10.3	404.4	40
14:19:42	126.2	11.3	463.3	45
14:20:42	126.2	12.3	522.3	49
14:21:42	126.2	13.3	584.0	54
14:22:42	126.2	14.3	645.1	59
14:22:46	126.2	14.4	650.1	59
14:22:51	126.2	14.6	661.5	60

Step Gas Usage

ID	Gas	Drum S/N	Lot Number	Usage Value
511	EO	E001214	UTLX902730L16	60lbs

Device	Summary	Summary Value		Specified Range
Current Phase Time	Final	00:12:10		00:06:27 - 00:25:48
Elapsed Phase Time	Final	00:12:10		n/a - N/A
TempAve	Min	126.1	°F	120.0 - 130.0 °F
TempAve	Max	126.2	°F	120.0 - 130.0 °F
PCurr	Final	14.6	inHg	13.9 - 15.9 inHg
PCurr	Final	14.6	inHg	n/a - 14.9 inHg
AT-EO	Final	661.5	mg/l	N/A - N/A mg/l
EO Weight Used	Final	60	lbs	N/A - N/A lbs

10. Phase » EO Dwell

(Phase No.7)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure	[mg/l] AT-EO	[lbs] EO Weight Used	[mg/l] AT-AH	[%] RH Sensor
13-Dec-16						
14:22:51	126.2	14.6	661.6	0	N/A	N/A
14:23:16	126.2	14.5	672.9	0	N/A	N/A
SYS Chamber was placed in hold mode while running Run ID 304143 at phase no. 7 - 0						
OPR Operator has requested hold mode						
14:23:52	126.1	14.5	676.9	0	N/A	N/A
14:24:52	126.1	14.5	672.9	0	N/A	N/A
14:25:52	126.0	14.4	673.0	0	N/A	N/A
14:26:52	126.0	14.4	672.9	0	N/A	N/A
14:27:52	125.9	14.4	673.9	0	N/A	N/A
14:28:52	125.9	14.4	684.4	0	N/A	N/A
14:29:52	125.8	14.4	672.9	0	N/A	N/A
14:30:52	125.7	14.4	673.0	0	N/A	N/A

...

10. Phase » EO Dwell

Device	Summary	Summary Value		Specified Range
Current Phase Time	Final	04:26:52		00:59:00 - 05:00:00
Elapsed Phase Time	Final	04:26:53		n/a - N/A
TempAve	Min	124.1	°F	120.0 - 130.0 °F
TempAve	Max	126.2	°F	120.0 - 130.0 °F
PCurr	Min	14.4	inHg	14.0 - 16.0 inHg
PCurr	Min	14.4	inHg	n/a - 14.9 inHg
PCurr	Max	14.6	inHg	14.0 - 16.0 inHg
PCurr	Max	14.6	inHg	n/a - 14.9 inHg
RH from AH Calc	Min	N/A	%	N/A - N/A %
RH from AH Calc	Max	N/A	%	N/A - N/A %
AT-AH	Min	N/A	mg/l	N/A - N/A mg/l
AT-AH	Max	N/A	mg/l	N/A - N/A mg/l
AT-EO	Min	661.6	mg/l	N/A - N/A mg/l
AT-EO	Max	684.5	mg/l	N/A - N/A mg/l
EO Weight Used	Final	0	lbs	N/A - N/A lbs

11. Phase » Vacuum

(Phase No.8)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure
13-Dec-16		
18:49:43	124.5	14.5
SYS Cycle has entered EO-Abort sequence while running Run ID 304143 at phase no. 8 - 0		
18:50:44	124.5	12.7
18:51:44	124.5	11.0
18:52:44	124.5	9.4
18:53:44	124.4	8.1
18:54:44	124.3	6.9
18:55:44	124.3	6.0
18:56:44	124.4	5.2
18:57:44	124.4	4.5
18:58:44	124.4	3.9
18:59:44	124.5	3.4
19:00:41	124.5	3.0
19:00:42	124.5	3.0

Device	Summary	Summary Value		Specified Range
Current Phase Time	Final	00:10:59		00:02:51 - 00:20:00
Elapsed Phase Time	Final	00:10:59		n/a - N/A
TempAve	Min	124.3	°F	120.0 - 130.0 °F
TempAve	Max	124.5	°F	120.0 - 130.0 °F
PCurr	Final	3.0	inHg	2.5 - 3.5 inHg
PCurr	Final	3.0	inHg	n/a - N/A inHg

12. Phase » Nitrogen Inject

(Phase No.9 - 1)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure	[mg/l] AT-EO

Report Summary

Total number of steps: 13

Gas Usage Summary

Gas	Usage Value
EO	60 lbs

Deviations

Total Number of deviations: 0

All dates are expressed in the timezone: (UTC) Coordinated Universal Time

STERIGENICS
7775 S QUINCY ST
WILLOWBROOK, IL 60527
1-630-654-5151
CHAMBER NO.2

JC 12DEC16

DATE	12/12/16 Mon	CYCLE 751		STERILANT	EO
PROG VERSION	KORSCP V3Q-4			CHECK VALUE	22130
RUN NUMBER	1860427			OPERATOR	R CASTELLANO

12D8014

CUSTOMER	MAINTENANCE
LOT NO.	ENG #1-12DEC2016
QUANTITY	NA
PRODUCT	NA

IRRENT TANK: LOT # E001579UTLX902730L16, TARE 266.0 LB
:ALE WEIGHT 355.0 LB, STERILANT LEFT 84.0 LB

PROCESS PARAMETERS

CHAMBER TEMP	125 F, COOL AT 135 F, BLOWER IS USED, ALARM REPETITION 15:00 MM:SS
VACUUM A	2.0 INHGA, 2.01 INHG/MIN, REQD 3.0 INHGA
LEAK TEST	0:05 HH:MM, TOLERANCE 0.2 INHG
NITROGEN DILUTION	2 CYCLES; NITROGEN: 24.0 INHGA, 1.51 INHG/MIN EVAC: 2.0 INHGA, 2.01 INHG/MIN
GAS A	1 CYCLES; INJ: 14.4 INHGA, 1.00 INHG/MIN, EO
GAS DWELL	14.4 INHGA, -0.2 INHG, DWELL 1:00 HH:MM
AFTER VACUUM	3.0 INHGA OR 0:45 HH:MM, 2.01 INHG/MIN, REQD 3.5 INHGA
GAS WASH A	3 CYCLES RLS: 23.0 INHGA, 1.51 INHG/MIN, NITR VAC: 3.0 INHGA OR 0:45 HH:MM, 2.01 INHG/MIN REQD 3.5 INHGA
GAS WASH B	1 CYCLES RLS: 23.0 INHGA, 1.51 INHG/MIN, AIR VAC: 3.0 INHGA OR 0:45 HH:MM, 2.01 INHG/MIN REQD 3.5 INHGA
RELEASE	28.0 INHGA, 1.51 INHG/MIN

TIME	PRESS INHGA	TEMP (DEG F) AVG	RH %	VAP ETO GAS MG/L	H2O MG/L	ALARMS & MESSAGES				ACTION TAKEN			
5:31	OPERATOR SENSOR CHECK --			PR	99.8,	RH	121,	JWT	128,	VLT	81,	VGX	107
	CT1	124,	CT2	122,	CT3	124,	P01	122,	P02	80,	P03	80,	P04 80
	P05	80,	P06	80,	P07	80,	P08	80,	P09	80,	P10	80,	P11 80
	P12	80,	P13	80,	P14	80,	P15	80,	P16	80,	P17	80,	P18 80
	P19	80,	P20	80,	ETO	0,	H2O	14.0,	WT	355.0			
5:45	OPERATOR SENSOR CHECK --			PR	99.8,	RH	121,	JWT	131,	VLT	81,	VGX	107
	CT1	124,	CT2	121,	CT3	123,	P01	122,	P02	81,	P03	81,	P04 81
	P05	81,	P06	81,	P07	81,	P08	81,	P09	81,	P10	81,	P11 81
	P12	81,	P13	81,	P14	81,	P15	81,	P16	81,	P17	81,	P18 81
	P19	81,	P20	81,	ETO	0,	H2O	15.7,	WT	355.0			
6:14	OPERATOR SENSOR CHECK --			PR	99.8,	RH	121,	JWT	132,	VLT	81,	VGX	109
	CT1	127,	CT2	123,	CT3	126,	P01	124,	P02	81,	P03	81,	P04 81
	P05	81,	P06	81,	P07	81,	P08	81,	P09	81,	P10	81,	P11 81
	P12	81,	P13	81,	P14	81,	P15	81,	P16	81,	P17	81,	P18 81
	P19	81,	P20	81,	ETO	0,	H2O	19.9,	WT	354.9			

Message

From: Sasser, Erika [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=477638FE84004800BFDF8E62FE3CAFC8-ESASSER]
Sent: 6/22/2018 1:01:58 PM
To: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Beckmann, Ronna Erin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ca0a5c6dfb9f407cbc70b71eeab91ace-Rbeckman]; Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Damico, Genevieve [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7d289d99160143fdafee7039dc99807a-GDamico]; Furey, Eileen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5aaa3a0ee58047d983897c53c1eb283e-EFurey]; Kelley, Jeff [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e154fa5a5f744c70aa3da58e3f87aabe-JKelley]; Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Nwia, Jacqueline [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d299b56bd7ef46709fb7465fd1e15466-JNwia]; Olson, Erik [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b05e7846315e4bf4b9d0df0afdb3eb43-EOlson02]
CC: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: RE: Siegel, Kathryn has shared 'Sterigenics Talking points'

Katie—

We are struggling to keep up with the different materials here. It would be very helpful if they could all be loaded into sharepoint in a common folder so we are organized about responding. Our team here is working to give you one set of integrated comments on each document, which requires a little extra time. We are seeing some technical issues which concern us, and we are focusing on those issues. We think that there is significant work remaining on these materials and we are not ready to conclude review. It may take significant time to ensure they are accurate. We are working as quickly as we can, and I know you all are doing the same.

Please confirm that these are the documents that are in prep:

1) Website materials
2) Public Talking Points and Q&A
3) Employee Talking Points
4) Press Release

Thanks,
Erika

Director, Health and Environmental Impacts Division
Office of Air Quality Planning & Standards, U.S. EPA
109 T.W. Alexander Drive, MD C504-02, RTP, NC 27711
(919) 541-3889 sasser.erika@epa.gov

From: Siegel, Kathryn
Sent: Friday, June 22, 2018 8:37 AM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>; Sasser, Erika <Sasser.Erika@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Beckmann, Ronna Erin <beckmann.ronna@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Damico, Genevieve <damico.genevieve@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Kelley, Jeff <kelley.jeff@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>; Olson, Erik <olson.erik@epa.gov>
Subject: RE: Siegel, Kathryn has shared 'Sterigenics Talking points'

To avoid confusion, please make any edits in the version that Margaret Sieffert shared and not this one. Thanks!

From: Siegel, Kathryn [mailto:no-reply@sharepointonline.com]
Sent: Friday, June 22, 2018 7:28 AM
To: Sasser, Erika <Sasser.Erika@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Beckmann, Ronna Erin <beckmann.ronna@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Damico, Genevieve <damico.genevieve@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Kelley, Jeff <kelley.jeff@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>; Olson, Erik <olson.erik@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: Siegel, Kathryn has shared 'Sterigenics Talking points'

Per Ed's email, please make any edits or comments in tracked changes. Thanks to all!

Open Sterigenics Talking points.docx

See more related to Siegel, Kathryn in Delve.

Get the SharePoint mobile app!

Message

From: Nam, Ed [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A2653F1DDD59470688BA557DD84D9690-NAM, ED]
Sent: 6/25/2018 6:20:53 PM
To: Marshall, Sarah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=72eabf40d65441c794fe33dc2a042026-SMarsh02]
CC: Breneman, Sara [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=abec1970102a45cfb6b842503a9fae06-SBrenema]; Frank, Nathan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd8b205f55ab45dea0c01f08e714f8c1-NFrank02]; Damico, Genevieve [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7d289d99160143fdafee7039dc99807a-GDamico]; Olson, Erik [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b05e7846315e4bf4b9d0df0afdb3eb43-EOlson02]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Sterigenics Enforcement History

Sara, Sarah, Genevieve,

On today's call with Julie Armitage, she mentioned that there was a stack test conducted recently that showed compliance with the permit. Do we have access to this stack test? If so, can someone please get it? I'd like to know the date, and I'm sure Phuong can use it for her next round of modeling.

Thanks
-Ed

From: Marshall, Sarah
Sent: Friday, June 22, 2018 3:17 PM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Breneman, Sara <breneman.sara@epa.gov>; Frank, Nathan <frank.nathan@epa.gov>; Damico, Genevieve <damico.genevieve@epa.gov>; Olson, Erik <olson.erik@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Subject: RE: Sterigenics Enforcement History

Ed,

Deliberative Process / Ex. 5

Sarah Marshall
Section Chief
Air Enforcement and Compliance Assurance Section (MI/WI)
U.S. Environmental Protection Agency, Region 5
(312) 886-6797

From: Nam, Ed
Sent: Friday, June 22, 2018 2:24 PM
To: Marshall, Sarah <marshall.sarah@epa.gov>
Cc: Breneman, Sara <breneman.sara@epa.gov>; Frank, Nathan <frank.nathan@epa.gov>; Damico, Genevieve

<damico.genevieve@epa.gov>; Olson, Erik <olson.erik@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Subject: RE: Sterigenics Enforcement History

Thanks Sarah for the quick and excellent summary. Here's how I shortened it on my timeline. Deliberative Process / Ex. 5 Deliberative Process / Ex. 5 I will port this to the FAQ if you are ok with my summary.

Milestone	Date
ARD enforcement action concludes with facility agreeing to install continuous monitoring system on aeration room vents	2004
ARD approves facility request to use ATT dry bed reactor when AAT scrubber is under repair or maintenance	2009
IEPA issues NOV for excess EtO emissions from Sterilization Chamber B in violation of CAAP permit requiring 99% reductions (also water and soil release)	11/12/13
IEPA issues CAAP permit, good for 5 years	6/8/15
IEPA/IAG resolved referred enforcement action: $50,000 penalty, site remediation plan completed.	9/8/15
EPA updated EtO from a "probable human carcinogen" to a "human carcinogen"	12/2016

From: Marshall, Sarah
Sent: Friday, June 22, 2018 11:35 AM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Breneman, Sara <breneman.sara@epa.gov>; Frank, Nathan <frank.nathan@epa.gov>; Damico, Genevieve <damico.genevieve@epa.gov>; Olson, Erik <olson.erik@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Subject: RE: Sterigenics Enforcement History

I added the IEPA violations below.

Sarah Marshall
Section Chief
Air Enforcement and Compliance Assurance Section (MI/WI)
U.S. Environmental Protection Agency, Region 5
(312) 886-6797

From: Nam, Ed
Sent: Friday, June 22, 2018 10:44 AM
To: Marshall, Sarah <marshall.sarah@epa.gov>
Cc: Breneman, Sara <breneman.sara@epa.gov>; Frank, Nathan <frank.nathan@epa.gov>
Subject: RE: Sterigenics Enforcement History

Thanks Sarah,

It looks like our emails crossed. Can you (or someone else) please add a brief summary of the IEPA enforcement actions that I sent you to the nice talking points below? I assume it corresponds to your last bullet. This is going into the FAQ, so it should be brief and consumable to the public and congressionals.

Thanks,
-Ed

From: Marshall, Sarah
Sent: Friday, June 22, 2018 10:37 AM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Breneman, Sara <breneman.sara@epa.gov>
Subject: Sterigenics Enforcement History

Ed,

There are two facilities in Illinois, Willowbrook and Schaumburg. Those are the only two facilities located in Region 5. There are other facilities in other regions. There is no enforcement history at Schaumburg.

At Willowbrook, EPA's last inspection was in 2002. A violation was found and an unilateral Administrative Order was issued to the facility to correct the following violations of 40 C.F.R. Part 63 Subpart O -Ethylene Oxide Emissions Standards for Sterilization Facilities:

- Failed to install and operate a continuous monitoring system to measure emissions and process parameters from the aeration room vents;
- Failed to monitor emissions from the aeration room; and
- Failed to maintain records.

The case was closed in 2004.

In 2009, there was a determination request submitted to EPA for approval to use the ATT dry bed reactor(SC-2) whenever the AAT Scrubber (SC-1) is under repair or maintenance, therefore a Revised AAT Dry Bed Monitoring Plan for Willowbrook 1 and 11 Facilities.

According to ECHO, at the Willowbrook facility, the last state FCE was in 2016. IEPA reported that there were deviations reported in the Title V certification.

IEPA settled an air enforcement case on 9/18/15 for violations at the Willowbrook facility. There were also violations related to a release of ethylene glycol into the soil and groundwater.

- On October 21, 2013, the facility released 12 pounds of ethylene oxide to the atmosphere.
- IEPA issued a violation notice on November 12, 2013 for the following violations:
    - Caused, threatened or allowed the discharge of ethylene oxide into the atmosphere from Sterilization Chamber B, so as to cause air pollution;
    - Failed to remove Sterilization Chamber B from service or take other actions to cease excess emissions;
    - Failed to reduce ethylene oxide by 99% during the event;
    - Failed to reduce volatile organic matter by 81% during the event.
- The facility paid a $50,000 penalty

There is no IEPA enforcement history at the Schaumburg facility.

Hope this helps.

Sarah Marshall
Section Chief
Air Enforcement and Compliance Assurance Section (MI/WI)
U.S. Environmental Protection Agency, Region 5
(312) 886-6797

Appointment

From: Microsoft Outlook [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=MICROSOFTEXCHANGE329E71EC88AE4615BBC36AB6CE41109EF7088051]
Sent: 6/22/2018 12:49:20 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]

Subject: Meeting Forward Notification: USEPA-Illinois EPA-Sterigenics Discussion of EtO
Location: (202) 991-0477, 3174209

Start: 6/22/2018 3:00:00 PM
End: 6/22/2018 3:45:00 PM

Recurrence: (none)

Your meeting was forwarded

Siegel, Kathryn has forwarded your meeting request to additional recipients.

Meeting

USEPA-Illinois EPA-Sterigenics Discussion of EtO

Meeting Time

Friday, June 22, 2018 10:00 AM-10:45 AM.

Recipients

Furey, Eileen

All times listed are in the following time zone: (UTC-06:00) Central Time (US & Canada)

Sent by Microsoft Exchange Server

Message

From: Nwia, Jacqueline [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D299B56BD7EF46709FB7465FD1E15466-JNWIA]
Sent: 7/3/2018 6:13:58 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]
CC: Qazzaz, Bilal [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=779fa066f1974031969ce3f09a410d78-BQazzaz]; Compher, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e258cb856e3d4ae6bacca7fa48ca827a-MCompher]; Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]
Subject: Sterigenics Final Monitoring Summary Report and Deviations from QAPP Memorandum
Attachments: 20180703_Sterigenics Monitoring Report.pdf; 20180703_Sterigenics Monitoring Deviations from QAPP.pdf

Attached please find the final report summarizing the ethylene oxide monitoring data near Sterigenics as well as the deviations from QAPP memorandum. I will save them on the Sharepoint site so all have access to them.

Thank you.

Jackie

Jacqueline Nwia
Environmental Scientist
Air Monitoring and Analysis Section
Air Toxics and Assessment Branch
Air and Radiation Division
U.S. Environmental Protection Agency, Region 5
77 West Jackson Blvd. (AR-18)
Chicago, IL 60604
ph. (312) 886-6081
nwia.jacqueline@epa.gov

SUBJECT: Sterigenics, Willowbrook, IL: Ethylene Oxide Air Monitoring

PREPARED BY:

Jacqueline Nwia
Environmental Scientist
Air Monitoring and Analysis Section
Region 5

FIELD MONITORING CONDUCTED BY:

Jacqueline Nwia
Environmental Scientist
Air Monitoring and Analysis Section
Region 5

Margaret Sieffert
Environmental Scientist
Toxics and Global Atmospheres Section
Region 5

FIELD MONITORING REQUESTED BY:

Alexis Cain
Section Chief
Toxics and Global Atmospheres Section
Region 5

DATES OF FIELD MONITORING: May 16-18, 2018

REPORT AUTHORIZED BY:

Michael S. Compher 7/3/18
Michael Compher
Supervisor
Air Monitoring and Analysis Section
Region 5

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ED_002192_00004263-00003

Methods:

US EPA Region 5 (R5) utilized the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air Second Edition Compendium Method TO-15 Determination Of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/ Mass Spectrometry (GC/MS) (TO-15) for analyzing samples collected in the area near Sterigenics in Willowbrook, IL. The method entails collecting 12-hour composite or grab ambient air samples in SUMMA canisters, which were prepared by a contract laboratory (Eastern Research Group (ERG) through EPA's national air toxics contract. Once samples were collected, the canisters containing the sampled air were shipped to ERG for ethylene oxide (EtO) analysis using GC/MS.

To aid in the assessment of EtO concentrations, a portable meteorological tower was installed on the roof of a nearby building (R5's Willowbrook Warehouse @ 600 Joliet Road, Willowbrook, IL). The meteorological tower collected 5-minute wind speed and wind direction values. The latitude/longitude location of each sample, either 12-hour composite or grab, was recorded using latitude/longitude points obtained through a mobile phone compass application. A sampling plan and Quality Assurance Project Plan (QAPP) were developed for this project. Additional information can be found in the sampling plan (2018May10-EtOSsamplingPlan) and Quality Assurance Project Plan (Sterigenics_QAPP_1.0).

In accordance with the QAPP, ambient EtO concentrations are compared to the minimum detection limit (MDL) which was determined by ERG to be 0.082 ug/m^3 (previously, the MDL was 0.0907 ug/m^3. However, ERG calibrated and recalculated the MDL just prior to analyzing the canister samples from Willowbrook to 0.082 ug/m^3), a concentration associated with an upper-bound lifetime probability of developing cancer of about 410 in a million if exposure occurred continuously at that concentration for 70 years. EPA's revised (2016) upper bound inhalation unit risk estimate of EtO cancer potency is 0.005[1] per ug/m^3. R5 collected ambient air samples around the Sterigenics facility on May 16-18, 2018 to evaluate the concentrations of EtO.

Quality Assurance/Quality Control (QA/QC)

ERG adhered to QA/QC procedures established in their QAPP[2] which was approved by EPA on May 19, 2017. ERG's quality assured/controlled raw data results were provided to EPA in Excel spreadsheet format[3]. In addition to calibration checks and blank sample analysis, ERG performed replicate analysis of each duplicate sample collected in accordance with their QA/QC procedures. All results passed the QA/QC data analysis.

Data Validation

R5's Sterigenics project QAPP[4] requires data validation review by the QA Coordinator, Bilal Qazzaz, to determine whether DQOs are met. However, due to reassignment of work, Marta Fuoco, of the Air

[1] EPA/635/R-16/350Fa, www.epa.gov/iris. Evaluation of the Inhalation Carcinogenicity of Ethylene Oxide (CASRN 75-21-8) In Support of Summary Information on the Integrated Risk Information System (IRIS). December 2016, National Center for Environmental Assessment, Office of Research and Development, U.S. Environmental Protection Agency, Washington, DC.

[2] Support for the EPA National Monitoring Programs (UATMP, NATTS, CSATAM, PAMS, and NMOC Support) Contract No. EP-D-14-030 2017 Quality Assurance Project Plan Category 1.

[3] Eto may 18 voc.xls file sent from Julie Swift (ERG) to U.S. EPA on May 30, 2018.

[4] Quality Assurance Project Plan; Sterigenics, Willowbrook, Illinois Ethylene Oxide Air Monitoring Study (Sterigenics_QAPP_1.0)

Monitoring and Assessment Section (AMAS) conducted the data validation review[5]. Data validation procedures identified two invalid data points, specifically, 2 collocated data points (LABSAMPIDs 8051813-08 and 8051813-09) collected on May 16, 2018 (0.158 ug/m^3 and 0.405 ug/m^3) which didn't meet the acceptance criteria of ≤ 30% relative percent difference (RPD) or 5 times the MDL. These 2 data points had an RPD of over 87% (See tables in Appendix A). The 0.158 ug/m^3 value was the lowest sample value collected during this sampling campaign, and it is more challenging for low concentration collocated measure values to meet the 30% RPD criteria.

Data Quality Objectives

The primary objective of ambient air monitoring was to determine whether ethylene oxide is detectable near the Sterigenics facility. Other objectives were to determine how the ambient levels compare to the 2014 NATA and more refined AERMOD modeled concentrations[6]. Data is of sufficient quantity and quality to address these questions.

Data quality objectives (DQO) and criteria are identified in the QAPP as follows:

1. Data completeness is 75% of total samples.
    a. Although 2 data points were invalidated out of the total 19 12-hour composite samples, 17 were validated, exceeding the 75% DQO established in the QAPP
    b. All 17 grab samples were validated, exceeding the 75% DQO established in the QAPP.
    c. All samples exceed the ERG's MDL of 0.082 ug/m^3.
    d. Despite shifting winds, review of the data concludes that sufficient downwind samples were collected.

Quality assurance, quality control and data quality objectives and criteria are met with the sampling and analysis conducted for this study.

Results

The tables, graphs and maps below present and illustrate the data and results collected May 16-18, 2018. Table 1 presents all samples and EtO concentrations collected for this study while Tables 2 and 3 separate the 12-hour composite and grab samples. EtO concentrations above the MDL were measured for all 12-hour composite and grab samples.

Table 1: All Results Table (QX=Invalidated data: Failed QC Criteria)

Sampling Date	Sampling Time	Canister Number	Sample Duration	EtO (ug/m^3)	Detection Limit (ug/m^3)
5/16-17/2018	6:41PM - 6:20AM	A21042	11 hrs 39 min	9.09	0.164
5/16-17/2018	6:41PM - 6:20AM	SAT027	11 hrs 39 min (dupicate)	8.33	0.164
5/17/2018	7:27AM - 6:52PM	19650	11 hrs 25 min	8.236	0.082
5/17-18/2018	6:58PM - 6:37AM	18827	11 hrs 39 min	4.94	0.082
5/17/2018	6:54AM - 6:15PM	19662	11 hrs 21 min	4.56	0.082
5/16/2018	1:26 PM	SAT085	Grab	4.34	0.082
5/16/2018	1:12 PM	5132	Grab	4.27	0.082

[5] Deviations from Sterigenics QAPP, Memorandum from Jacqueline Nwia to Bilal Qazzaz, July 3, 2018

[6] The 2014 NATA is anticipated to be publicly released in mid-late-2018. More refined AERMOD modeling was performed by Region 5's Air Toxics and Assessment Branch staff based on estimated inputs.

Sampling Date	Sampling Time	Canister Number	Sample Duration	EtO (ug/m³)	Detection Limit (ug/m³)
5/16-17/2018	7:01PM - 6:59AM	19641	11 hrs 58 min	3.87	0.082
5/17-18/2018	6:58PM - 6:37AM	5124	11 hrs 39 min (duplicate)	3.69	0.082
5/16/2018	7:21AM - 5:37PM	5142	10 hrs 16 min	3.55	0.082
5/16/2018	12:50 PM	SAT169	Grab (duplicate)	2.28	0.082
5/16/2018	12:50 PM	A21056	Grab	2.17	0.082
5/16-17/2018	7:28PM - 7:12AM	19652	11 hrs 44 min	2.12	0.082
5/16/2018	12:37PM	SAT094	Grab	1.57	0.082
5/17/2018	2:46 PM	SAT009	Grab	1.34	0.082
5/17/2018	10:42 AM	5052	Grab (duplicate)	1.04	0.082
5/17/2018	10:42 AM	SAT173	Grab	1.02	0.082
5/17/2018	6:29AM - 5:53PM	5017	11 hrs 24 min	1.01	0.082
5/17/2018	7:16AM - 6:23PM	18864	11 hrs 7 min	0.979	0.082
5/17/2018	2:33 PM	SAT034	Grab	0.936	0.082
5/17/2018	7:07AM - 6:30PM	5100	11 hrs 23 min	0.867	0.082
5/17/2018	6:29AM - 5:53PM	19290	11 hrs 24 min (duplicate)	0.789	0.082
5/16-17/2018	7:13PM - 7:01AM	SAT074	11 hrs 48 min	0.659	0.082
5/16/2018	7:37AM - 5:50PM	5090	10 hrs 13 min	0.518	0.082
5/17/2018	10:53 AM	A21012	Grab	0.494	0.082
5/16/2018	7:50AM - 5:44PM	SAT007	9 hrs 44 min	0.463	0.082
5/17/2018	2:53 PM	5072	Grab	0.447	0.082
5/17/2018	10:59 AM	5053	Grab	0.411	0.082
5/17/2018	10:20 AM	SAT095	Grab	0.405	0.082
5/16/2018	6:56AM - 5:12PM	SAT166	10 hrs 16 min	QX	0.082
5/16/2018	1:04 PM	SAT061	Grab	0.355	0.082
5/17/2018	10:32 AM	SAT133	Grab	0.338	0.082
5/17-18/2018	6:43PM - 6:29AM	5101	11 hrs 46 min	0.338	0.082
5/17/2018	10:33 AM	A21065	Grab	0.291	0.082
5/17/2018	2:36 PM	SAT101	Grab	0.243	0.082
5/16/2018	12:29PM	19644	Grab	0.221	0.082
5/17/2018	2:27 PM	19294	Grab (duplicate)	0.214	0.082
5/17/2018	3:05 PM	SAT020	Grab	0.206	0.082
5/17/2018	2:59 PM	19651	Grab	0.174	0.082
5/17/2018	2:27 PM	18875	Grab	0.163	0.082
5/16/2018	6:56AM - 5:09PM	19277	10 hrs 13 min (duplicate)	QX	0.082

Table 2: 12-hr Composite Sample Results (QX=Invalidated data: Failed QC Criteria)

Sampling Date	Sampling Time	Canister Number	EtO (ug/m^3)	Detection Limit (ug/m^3)
5/17/2018	7:27AM - 6:52PM	19650	8.236	0.082
5/17/2018	6:54AM - 6:15PM	19662	4.56	0.082
5/16-17/2018	7:01PM - 6:59AM	19641	3.87	0.082
5/16/2018	7:21AM - 5:37PM	5142	3.55	0.082
5/16-17/2018	7:28PM - 7:12AM	19652	2.12	0.082
5/17/2018	7:16AM - 6:23PM	18864	0.979	0.082
5/17/2018	7:07AM - 6:30PM	5100	0.867	0.082
5/16-17/2018	7:13PM - 7:01AM	SAT074	0.659	0.082
5/16/2018	7:37AM - 5:50PM	5090	0.518	0.082
5/16/2018	7:50AM - 5:44PM	SAT007	0.463	0.082
5/17-18/2018	6:43PM - 6:29AM	5101	0.338	0.082
5/16-17/2018	6:41PM - 6:20AM	A21042	9.09	0.164
5/16-17/2018	6:41PM - 6:20AM	SAT027	8.33	0.164
5/17-18/2018	6:58PM - 6:37AM	18827	4.94	0.082
5/17-18/2018	6:58PM - 6:37AM	5124	3.69	0.082
5/17/2018	6:29AM - 5:53PM	5017	1.01	0.082
5/17/2018	6:29AM - 5:53PM	19290	0.789	0.082
5/16/2018	6:56AM - 5:12PM	SAT166	QX	0.082
5/16/2018	6:56AM - 5:09PM	19277	QX	0.082

Table 3: Grab Sample Results

Sampling Date	Sampling Time	Canister Number	EtO (ug/m^3)	Detection Limit (ug/m^3)
5/16/2018	12:50 PM	SAT169	2.28	0.082
5/16/2018	12:50 PM	A21056	2.17	0.082
5/17/2018	10:42 AM	5052	1.04	0.082
5/17/2018	10:42 AM	SAT173	1.02	0.082
5/17/2018	2:27 PM	19294	0.214	0.082
5/17/2018	2:27 PM	18875	0.163	0.082
5/16/2018	1:26 PM	SAT085	4.34	0.082
5/16/2018	1:12 PM	5132	4.27	0.082
5/16/2018	12:37PM	SAT094	1.57	0.082
5/17/2018	2:46 PM	SAT009	1.34	0.082
5/17/2018	2:33 PM	SAT034	0.936	0.082
5/17/2018	10:53 AM	A21012	0.494	0.082
5/17/2018	2:53 PM	5072	0.447	0.082

Sampling Date	Sampling Time	Canister Number	EtO (ug/m^3)	Detection Limit (ug/m^3)
5/17/2018	10:59 AM	5053	0.411	0.082
5/17/2018	10:20 AM	SAT095	0.405	0.082
5/16/2018	1:04 PM	SAT061	0.355	0.082
5/17/2018	10:32 AM	SAT133	0.338	0.082
5/17/2018	10:33 AM	A21065	0.291	0.082
5/17/2018	2:36 PM	SAT101	0.243	0.082
5/16/2018	12:29PM	19644	0.221	0.082
5/17/2018	3:05 PM	SAT020	0.206	0.082
5/17/2018	2:59 PM	19651	0.174	0.082

The figures below were created using Excel and Geoplatform GIS application. Figure 1 is a time series plot illustrating grab and 12-hour composite samples throughout the sampling period. Figure 2 presents results for 12-hour composite and grab samples clustered by event (day/time). The maps illustrate each sampling event with the corresponding wind speed/wind direction plots. Figures 3-9 demonstrate the following:

- In general, predominant daytime winds were from the northeast resulting in higher ambient concentrations measured downwind of Sterigenics (southwest of the facility) (Figures 3,4,6,7 and 8).
- In general, predominant overnight winds were light and variable resulting in some of the highest concentrations measured closer to the facility (@ Willowbrook building) (Figures 5 and 9).
- As noted previously, all samples resulted in concentrations well above the MDL.
- The monitored ambient concentrations coupled with the wind roses demonstrate that Sterigenics is likely the source of the EtO detected in the ambient air since it is the largest source of EtO in the immediate area. The closest known other EtO sources are more than four miles away.

Figure 1: Time Series Plot: All Data

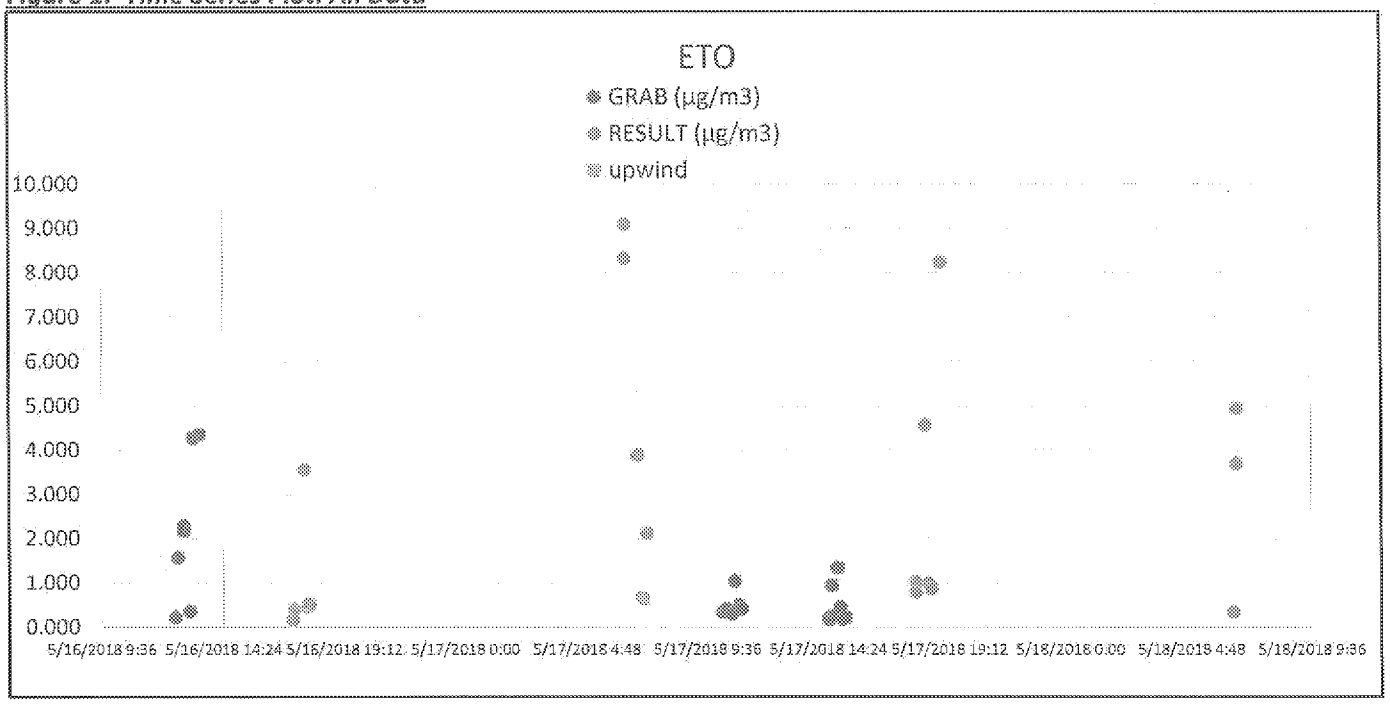


Figure 2: Results Clustered by Sampling Event (Day/time)

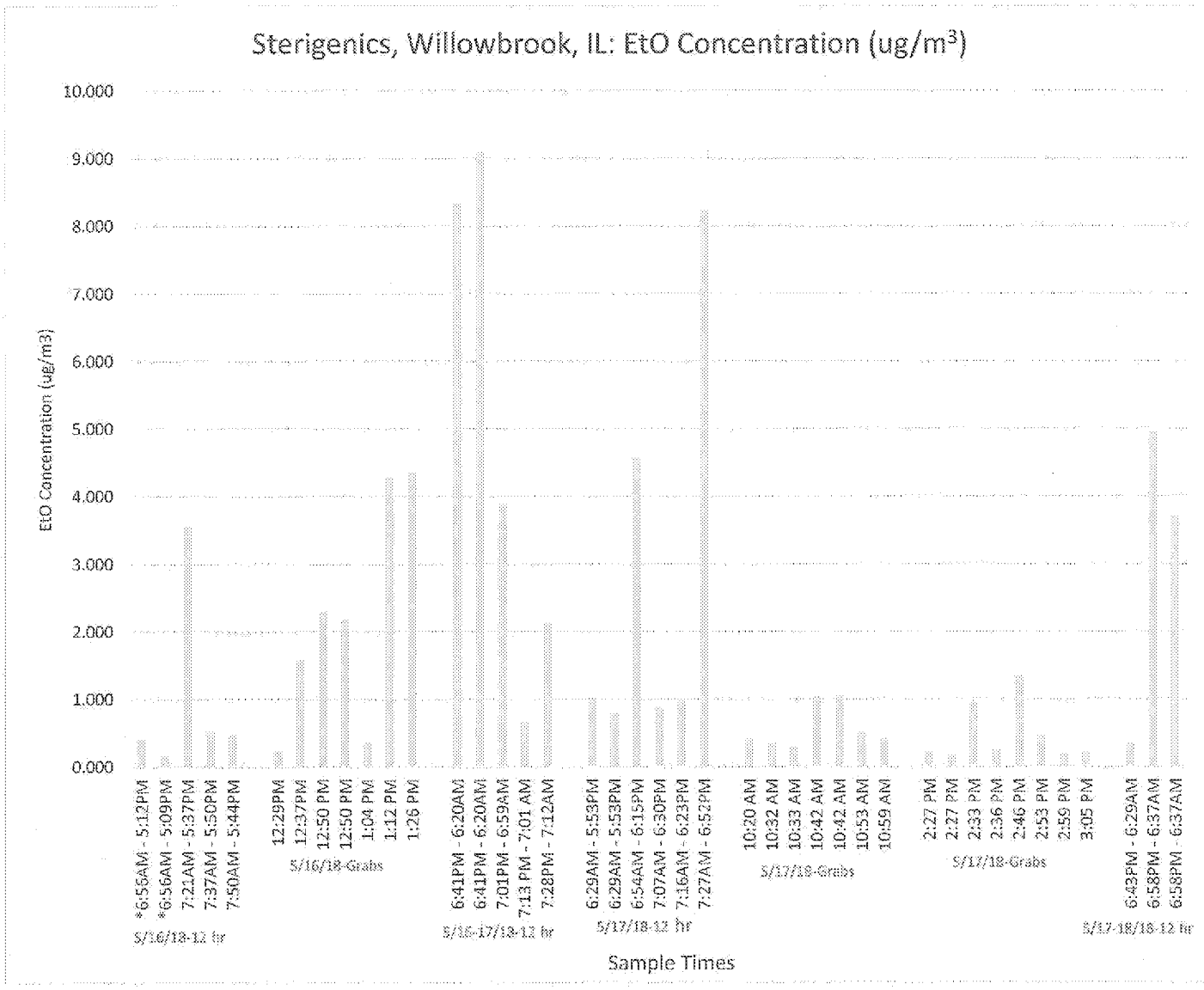


Figure 3: May 16, 2018: 12-hr Daytime Composite Results with Meteorological Data

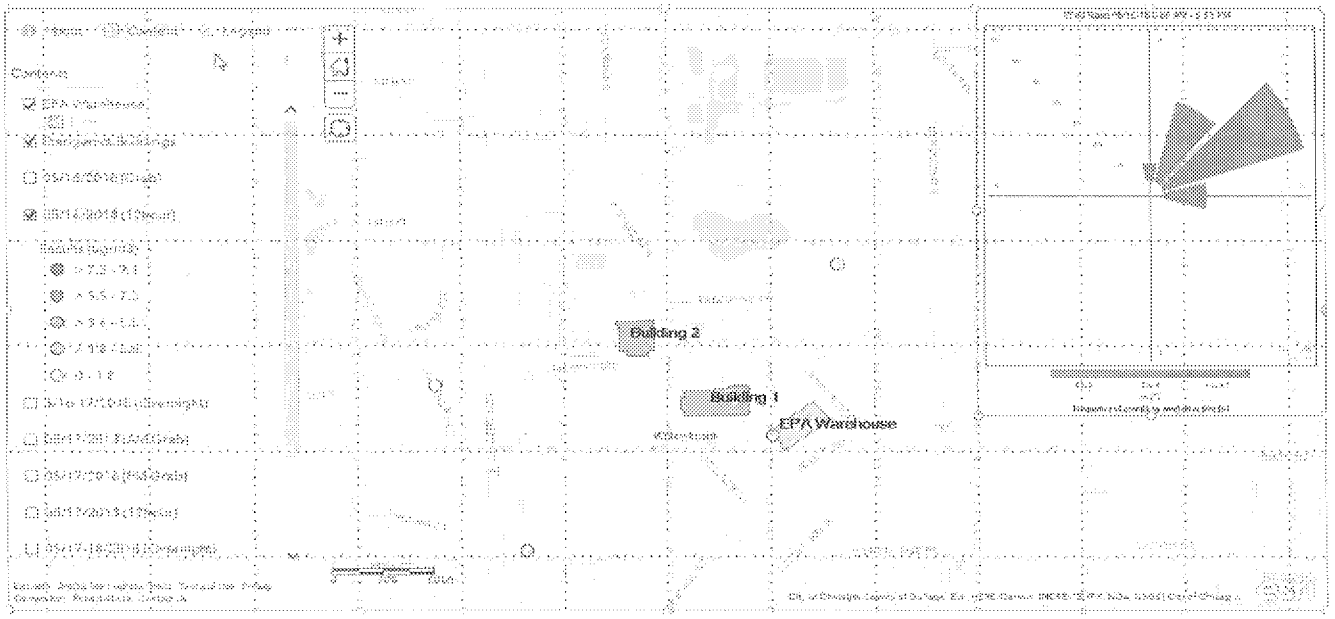


Figure 4: May 16, 2018: Grab Sample Results with Meteorological Data

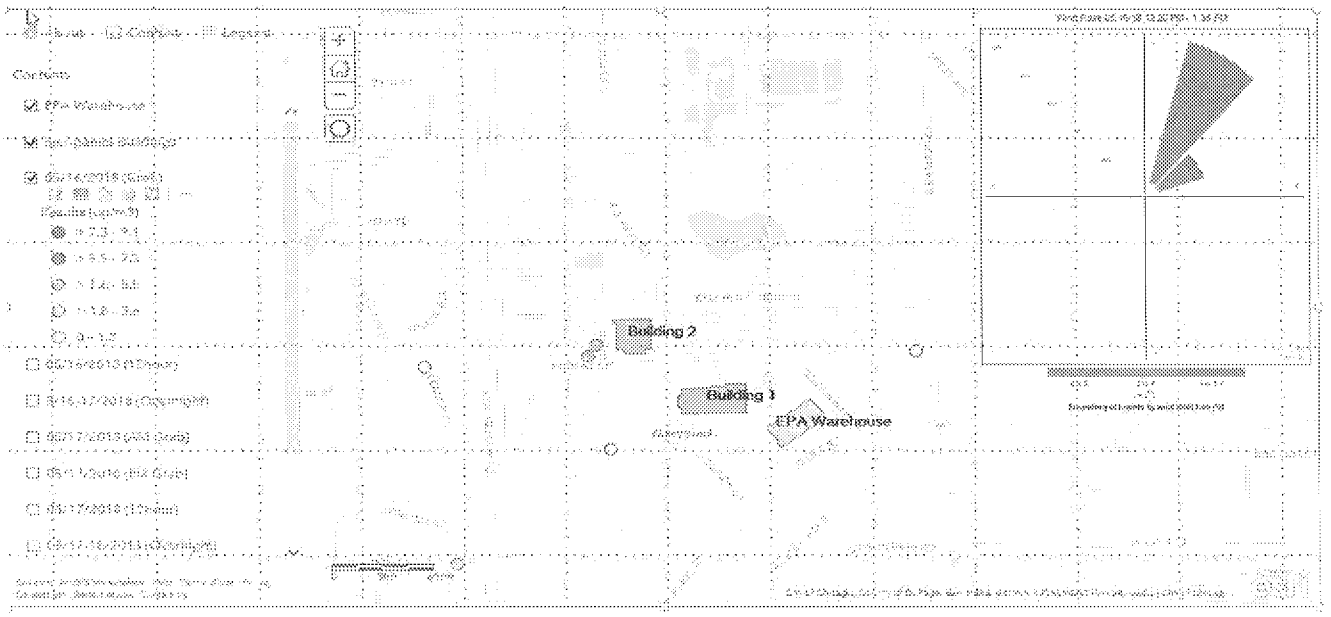


Figure 5: May 16-17, 2018: 12-hr Overnight Composite Results with Meteorological Data

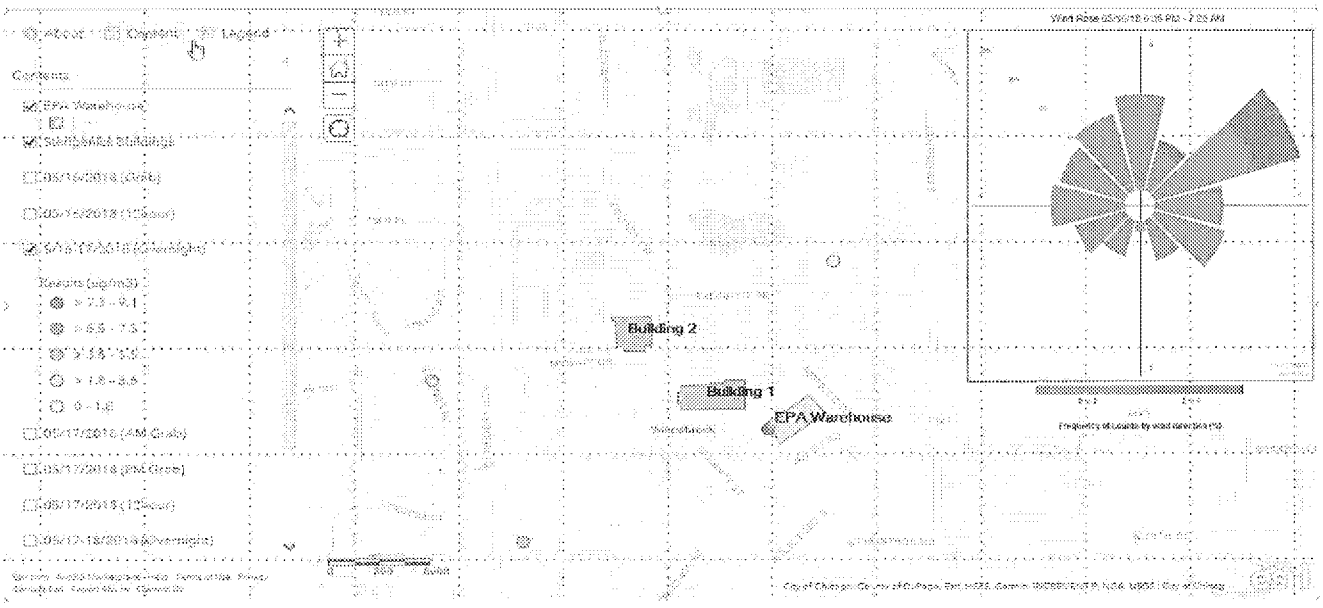


Figure 6: May 17, 2018: 12-hr Daytime Composite Results with Meteorological Data

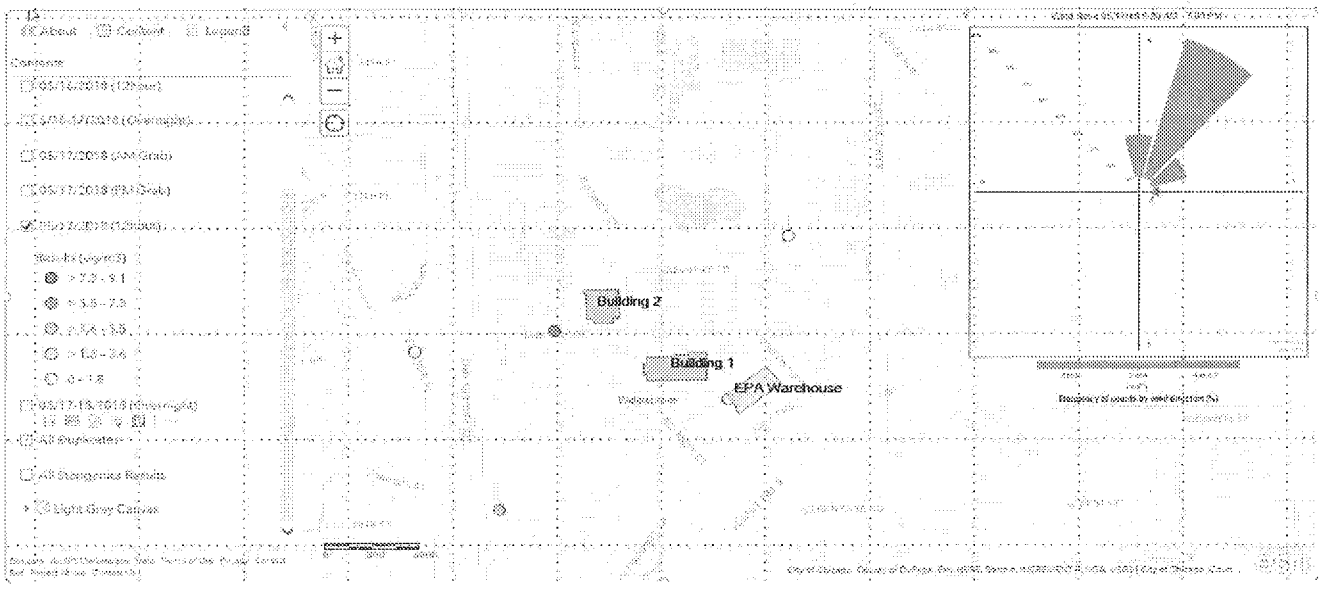


Figure 7: May 17, 2018: Mid-morning Grab Sample Results with Meteorological Data

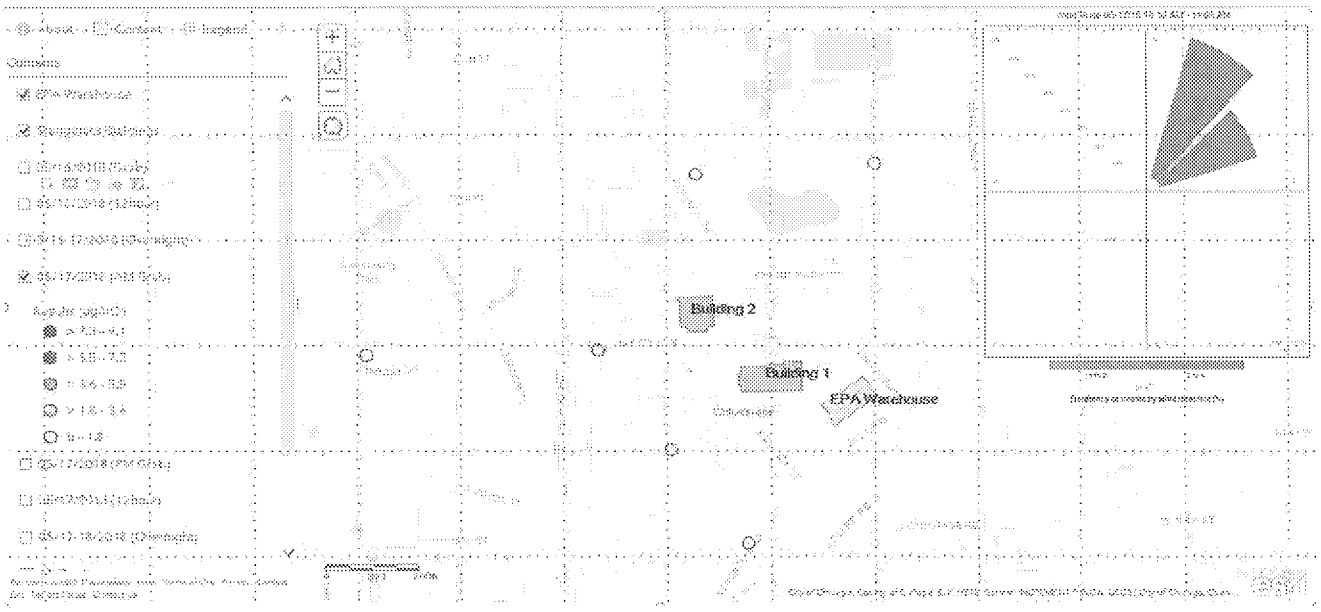


Figure 8: May 17, 2018: Mid-afternoon Grab Sample Results with Meteorological Data

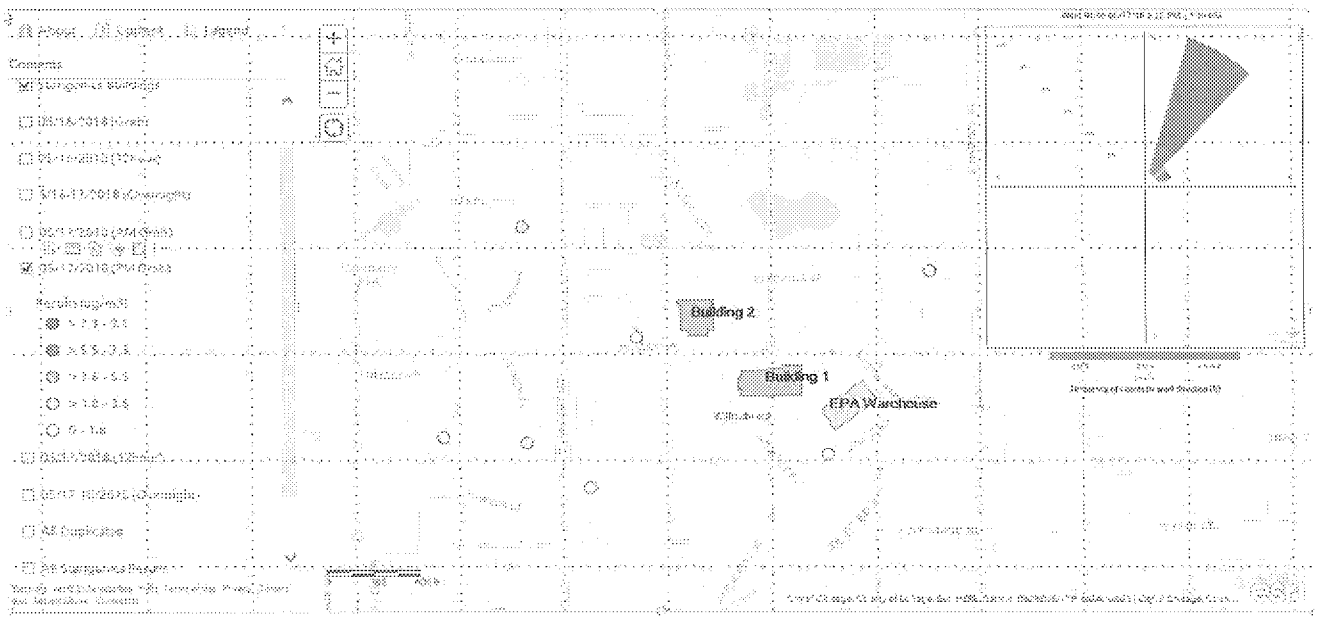
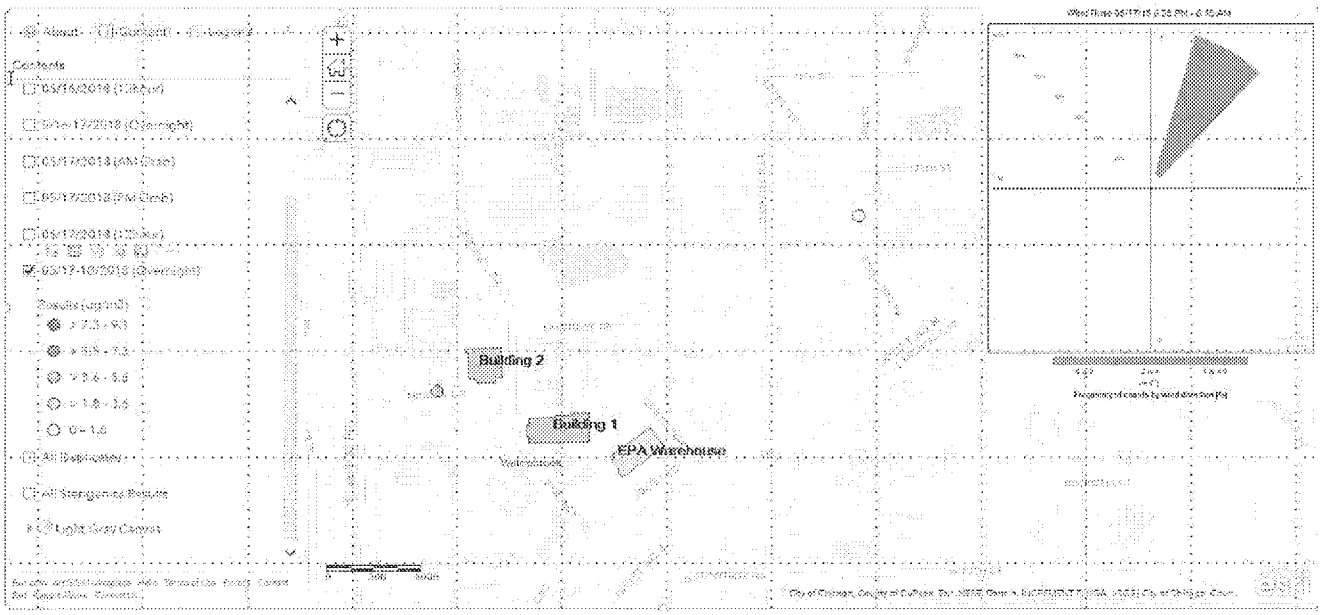


Figure 9: May 17-18, 2018: 12-hr Overnight Composite Results with Meteorological Data



Attachment A

SAMPLENAME	LABSAMPID	SAMPDATE	PREPDATE	ANADATE	RESULT (ppbv)	ANOTE	DL (ppbv)	RESULT (µg/m3)	ANOTE	DL (µg/m3)	RPD (ABS(L4-L5)/R4)*100	Arith Mean	5x MDL	Acceptance criteria (DUP) <30% RPD for cpds > 5xMDL)
EtO Grab 41.7489,-87.9353	8051813-01	5/16/2018 12:30	5/16/2018	5/22/2018	0.122		0.0453	0.221		0.082				
EtO Grab 41.7471,-87.9420	8051813-02	5/16/2018 12:38	5/16/2018	5/22/2018	0.867		0.0453	1.57		0.082				
EtO Grab D1 41.7450,-87.9454	8051813-03	5/16/2018 12:51	5/16/2018	5/21/2018	1.26		0.0453	2.28		0.082	4.878	2.23	0.410	YES
EtO Grab D2 41.7450,-87.9454	8051813-04	5/16/2018 12:51	5/16/2018	5/21/2018	1.2		0.0453	2.17		0.082				
EtO Grab 41.7486,-87.9461	8051813-05	5/16/2018 13:05	5/16/2018	5/22/2018	0.196		0.0453	0.355		0.082				
EtO Grab 41.7490,-87.9423	8051813-06	5/16/2018 13:13	5/16/2018	5/22/2018	2.36		0.0453	4.27		0.082				
EtO Grab 41.7483,-87.9459	8051813-07	5/16/2018 13:27	5/16/2018	5/22/2018	2.4		0.0453	4.34		0.082				
EtO D1 41.7474,-87.9385	8051813-08	5/16/2018 17:06	5/16/2018	5/21/2018	0.0673		0.0453	0.155	ND	0.082	37.918	0.283	0.410	NO
EtO D2 41.7474,-87.9385	8051813-09	5/16/2018 17:13	5/16/2018	5/21/2018	0.124		0.0453	0.405	ND	0.082				
EtO 41.7453,-87.9439	8051813-15	5/16/2018 17:37	5/16/2018	5/22/2018	1.96		0.0453	3.55		0.082				
EtO 41.7505,-87.9371	8051813-17	5/16/2018 17:44	5/16/2018	5/22/2018	0.256		0.0453	0.463		0.082				
EtO 41.7483,-87.9459	8051813-10	5/16/2018 17:50	5/16/2018	5/22/2018	0.286		0.0453	0.518		0.082				
EtO D1 41.7474,-87.9385	8051813-11	5/17/2018 6:20	5/16/2018	5/22/2018	5.02	D	0.0906	9.09	D	0.164	8.732	8.706	0.820	YES
EtO D2 41.7474,-87.9385	8051813-12	5/17/2018 6:20	5/17/2018	5/22/2018	4.6	D	0.0906	8.33	D	0.164				
EtO 41.7453,-87.9439	8051813-16	5/17/2018 6:50	5/17/2018	5/22/2018	2.14		0.0453	3.87		0.082				
Ethylene Oxide Upwind 12hr 41.7505,-87.9371	8051813-13	5/17/2018 7:01	5/17/2018	5/22/2018	0.364		0.0453	0.659		0.082				
EtO 41.7483,-87.9459	8051813-14	5/17/2018 7:12	5/17/2018	5/22/2018	1.17		0.0453	2.12		0.082				
EtO Grab 41.7519,-87.9373	8052134-04	5/17/2018 10:12	5/17/2018	5/23/2018	0.187		0.0453	0.338		0.082				
EtO Grab 41.7517,-87.9415	8052134-07	5/17/2018 10:20	5/17/2018	5/23/2018	0.224		0.0453	0.405		0.082				
EtO Grab 41.7484,-87.9493	8052134-01	5/17/2018 10:34	5/17/2018	5/23/2018	0.161		0.0453	0.291		0.082				
EtO Grab D1 41.7485,-87.9438	8052134-09	5/17/2018 10:42	5/17/2018	5/23/2018	0.564		0.0453	1.02		0.082	1.583	1.029	0.410	YES
EtO Grab D2 41.7485,-87.9438	8052134-10	5/17/2018 10:42	5/17/2018	5/23/2018	0.573		0.0453	1.04		0.082				
EtO Grab 41.7467,-87.9421	8052134-06	5/17/2018 10:53	5/17/2018	5/23/2018	0.273		0.0453	0.494		0.082				
EtO Grab 41.7450,-87.9403	8052134-15	5/17/2018 10:59	5/17/2018	5/23/2018	0.227		0.0453	0.411		0.082				
EtO Grab D1 41.7508,-87.9456	8052134-20	5/17/2018 14:27	5/17/2018	5/24/2018	0.0903		0.0453	0.163		0.082	26.596	0.189	0.410	YES
EtO Grab D2 41.7508,-87.9456	8052134-21	5/17/2018 14:27	5/17/2018	5/24/2018	0.118		0.0453	0.214		0.082				
EtO Grab 41.7469,-87.9455	8052134-19	5/17/2018 14:33	5/17/2018	5/24/2018	0.517		0.0453	0.936		0.082				
EtO Grab 41.7470,-87.9475	8052134-05	5/17/2018 14:36	5/17/2018	5/23/2018	0.134		0.0453	0.243		0.082				
EtO Grab 41.7461,-87.9440	8052134-02	5/17/2018 14:46	5/17/2018	5/23/2018	0.739		0.0453	1.34		0.082				
EtO Grab 41.7488,-87.9429	8052134-16	5/17/2018 14:53	5/17/2018	5/23/2018	0.247		0.0453	0.447		0.082				
EtO Grab 41.7500,-87.9360	8052134-17	5/17/2018 14:59	5/17/2018	5/24/2018	0.0961		0.0453	0.174		0.082				
EtO Grab 41.7467,-87.9384	8052134-03	5/17/2018 15:05	5/17/2018	5/23/2018	0.114		0.0453	0.206		0.082				
EtO D1 41.7474,-87.9385	8052134-22	5/17/2018 17:53	5/17/2018	5/24/2018	0.557		0.0453	1.01		0.082	24.271	0.899	0.410	YES
EtO D2 41.7474,-87.9385	8052134-23	5/17/2018 17:53	5/17/2018	5/24/2018	0.435		0.0453	0.789		0.082				
EtO 41.7453,-87.9439	8052134-08	5/17/2018 18:15	5/17/2018	5/23/2018	2.52		0.0453	4.56		0.082				
EtO 41.7483,-87.9459	8052134-18	5/17/2018 18:23	5/17/2018	5/24/2018	0.541		0.0453	0.979		0.082				
EtO 41.7505,-87.9371	8052134-24	5/17/2018 18:30	5/17/2018	5/24/2018	0.479		0.0453	0.867		0.082				
EtO 41.7487,-87.9426	8052134-14	5/17/2018 18:52	5/17/2018	5/23/2018	4.55		0.0453	8.236		0.082				

ED_002192_00004263-00015

SAMPLENAME	LABSAMPID	SAMPDATE	PREPDATE	ANADATE	RESULT (ppbv)	ANOTE	DL (ppbv)	RESULT (µg/m3)	ANOTE	DL (µg/m3)	RPD (ABS(L4-L5)/R4)*100	Arith Mean	5x MDL	Acceptance criteria (DUP) <30% RPD for cpds > 5xMDL)
EtO 41.7519,-87.9327	8052134-13	5/18/2018 6:29	5/18/2018	5/23/2018	0.187		0.0453	0.338		0.082				
EtO D1 41.7487,-87.9426	8052134-11	5/18/2018 6:37	5/18/2018	5/23/2018	2.73	D-F	0.0453	4.94	D-F	0.082	28.931	4.32	0.410	YES
EtO D2 41.7487,-87.9426	8052134-12	5/18/2018 6:37	5/18/2018	5/23/2018	2.04	D-F	0.0453	3.69	D-F	0.082				

Qualifier Codes: D = This result obtained by dilution; D-F = Duplicate exceeds DQO criteria; QX = Invalidated data/Failed QC Criteria

ED_002192_00004263-00016

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 6/12/2018 7:17:13 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]; Nwia, Jacqueline [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d299b56bd7ef46709fb7465fd1e15466-JNwia]
Subject: RA briefing document
Attachments: 2018 June 20 RA EtO Briefing .docx

I have drafted this briefing document, but before we share with management, please review. I used parts from documents we already created and left it short. Hopefully this captures what Ed wants.

Thanks, Margaret

Message

From: Bollweg, George [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1592106E02634BB2BDA8CC788B125F2C-GBOLLWEG]
Sent: 8/3/2018 9:19:22 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Sterigenics Badge Sample Data

Deliberative Process / Ex. 5

From: Cain, Alexis
Sent: Friday, August 3, 2018 1:42 PM
To: Bollweg, George <bollweg.george@epa.gov>
Subject: FW: Sterigenics Badge Sample Data

Ack—I invoked your name, but without actually sending it to you.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Cain, Alexis
Sent: Friday, August 03, 2018 8:03 AM
To: Furey, Eileen <furey.eileen@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Subject: RE: Sterigenics Badge Sample Data

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Furey, Eileen
Sent: Thursday, August 02, 2018 2:40 PM
To: Nam, Ed <nam.ed@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Subject: RE: Sterigenics Badge Sample Data

Ed, Alexis, and Katie –

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Eileen

Eileen L. Furey
Deputy Director
Air and Radiation Division
U.S. EPA Region 5
(312) 886-7950

From: Nam, Ed
Sent: Thursday, August 02, 2018 2:07 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Subject: FW: Sterigenics Badge Sample Data

Deliberative Process / Ex. 5; Attorney-Client / Ex. 5

Thanks,
-Ed

From: Glover, John
Sent: Thursday, August 02, 2018 1:44 PM
To: Nam, Ed <nam.ed@epa.gov>; Short, Thomas <short.thomas@epa.gov>
Cc: Padovani, Steven <padovani.steven@epa.gov>; Ballotti, Doug <ballotti.douglas@epa.gov>; Durno, Mark <durno.mark@epa.gov>; Newton, Cheryl <Newton.Cheryl@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Subject: RE: Sterigenics Badge Sample Data

Hi Ed,

I've attached the one page results summary as well as copies of the original analytical results to this email. In short, all indoor samples collect for Eto were undetected. The detection limit for the sampling media was 3.7 ppb EtO. The lowest established exposure limit for EtO is a NIOSH recommended limit of 160 ppb.

We also collected two outdoor samples. One of those was undetected, less than 3.7 ppb. A second samples, collected on July 2, 2018, had a concentration of EtO equal to 4.2 ppb. This number is consistent with the concentrations found by the Air Division in their earlier sampling event.

Let me know of you need anything else.

John D. Glover, Jr.
Regional Safety Manager
U.S. EPA Region 5

(312) 886-5301
(312) 692-2504 (fax)

From: Nam, Ed
Sent: Thursday, August 02, 2018 10:51 AM
To: Glover, John <Glover.John@epa.gov>; Short, Thomas <short.thomas@epa.gov>
Cc: Padovani, Steven <padovani.steven@epa.gov>; Ballotti, Doug <ballotti.douglas@epa.gov>; Durno, Mark <durno.mark@epa.gov>; Newton, Cheryl <Newton.Cheryl@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Subject: RE: Sterigenics Badge Sample Data

John, Mark, Tom, Doug,

If this data is QA/QCd, can I please get a briefing on this soon? Who should (or would like) to be at the meeting?

Also, Cathy, Kurt and Jim also would like a summary and may request a briefing afterwards. Can I please ask you to draft a 1 page summary of the testing and the results that I (or Doug or Cheryl) can pass up to Cathy? FYI: The Office of Air and Radiation is also requesting this same writeup, so we can satisfy two needs at once.

Thanks,
-Ed

From: Glover, John
Sent: Thursday, July 26, 2018 1:55 PM
To: Short, Thomas <short.thomas@epa.gov>
Cc: Padovani, Steven <padovani.steven@epa.gov>; Ballotti, Doug <ballotti.douglas@epa.gov>; Nam, Ed

<nam.ed@epa.gov>
Subject: RE: Sterigenics Badge Sample Data

Yes, all undetected indoors. < 3.7 ppb. One hit on the outdoor sample at 4.2 ppb. I just got the data a few days ago. I need to send it up through Cheryl Newton for release, but the numbers are just exactly what we expected.

John D. Glover, Jr.
Regional Safety Manager
U.S. EPA Region 5

(312) 886-5301
(312) 692-2504 (fax)

From: Short, Thomas
Sent: Thursday, July 26, 2018 1:54 PM
To: Glover, John <Glover.John@epa.gov>
Cc: Padovani, Steven <padovani.steven@epa.gov>; Ballotti, Doug <ballotti.douglas@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Subject: Sterigenics Badge Sample Data

Good afternoon John,

I understand that we use badges to collect air samples at Willowbrook a little while ago. Do we have the results back yet?

Thomas Richard Short Jr.
Acting Deputy Director
Superfund Division
312-353-8826
short.thomas@epa.gov

Appointment

From: Siegel, Kathryn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F57A52EFEAD9497CB582B11B8C85F09F-KSIEGE02]
Sent: 6/25/2018 4:47:29 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]

Subject: Accepted: EPA/Sterigenics all on Ethylene Oxide Emissions
Location: R5Metcalfe-ConfRm-R1811/R5-Metcalfe---18th-Floor

Start: 6/27/2018 4:00:00 PM
End: 6/27/2018 5:30:00 PM
Show Time As: Busy

Message

From: Nam, Ed [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A2653F1DDD59470688BA557DD84D9690-NAM, ED]
Sent: 7/2/2018 4:08:44 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Sterigenics - Met data & Plot files

Yes, please check that the date is ok with them too. I'm guessing they won't come in person, but they should still be on the call.

Thanks
-Ed

From: Cain, Alexis
Sent: Monday, July 02, 2018 10:52 AM
To: Nam, Ed <nam.ed@epa.gov>
Subject: RE: Sterigenics - Met data & Plot files

Will do. Should we check with Illinois EPA before scheduling, or go ahead?

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Nam, Ed
Sent: Monday, July 02, 2018 9:44 AM
To: Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Sterigenics - Met data & Plot files

Thanks for organizing. FYI: Please cc me on all communications with the company.

On the 16,17 Andrew Wheeler will be visiting, so let's stay in the office. I'm flexible on 18, 20, 26, and 27. I'd also like to avoid Mondays.

Thanks
-Ed

From: Cain, Alexis
Sent: Monday, July 02, 2018 9:33 AM
To: Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: FW: Sterigenics - Met data & Plot files

Sterigenics suggests the weeks of July 16 and 23 (excluding the 19th and 25th). I would like to exclude the 24th.

So . . . 7/16, 17, 18, 20, 23, 26, 27. Any preferences?

We probably should think also about who is essential. Do we want to take 12 people on a plant tour? I think Margaret is essential. I'd like to go, but I'm not essential. Danny? Jackie?

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Hoffman, Kathy [mailto:KHoffman@sterigenics.com]
Sent: Friday, June 29, 2018 4:25 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Subject: RE: Sterigenics - Met data & Plot files

Alexis:

Thank you very much for this data. I have forwarded it to our Ramboll consultants for further review. I have been conducting a training seminar this week and this is my first day in the office catching up on emails.

As for dates of where you might come out to Willowbrook, I am on vacation next week and in Cleveland most of the following week for corporate meetings. Could we schedule something the week of July 16th or 23rd? The facility is available these weeks except they have all-day customer audits on Thursday, July 19th and Wednesday, July 25th. I would like to prepare a more detailed description of our operations and emissions and then tour the facility. If needed, I could have someone from Engineering present and they can show the status of the backvent project too. We should be quite a bit into the project by then.

As mentioned, I am out of the office next week but will be checking emails.

Regards,
Kathy

From: Cain, Alexis [mailto:cain.alexis@epa.gov]
Sent: Wednesday, June 27, 2018 4:13 PM
To: Hoffman, Kathy
Subject: Sterigenics - Met data & Plot files

Hello Kathleen—we're very pleased to be working cooperatively with you to address ethylene oxide issues; thank you for that.

I've attached a file with the five-year meteorological data used for the modeling, the plot files for the period (five-year) average, 1-hr average, and 8- hr average, as well as the met data collected during our three-day sampling period.

Could you suggest some days when we might come out to Willowbrook for a presentation and tour? It would be great to connect voices to faces, as well as to see your operations.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov
This e-mail and any files transmitted with it may contain privileged and/or confidential information. If you believe this e-mail or any of its attachments were not intended for you, you must not use, distribute, forward, print or copy this e-mail or any attached files. If you have received this e-mail in error, please notify the sender by reply e-mail and then immediately delete the email and all attachments.

Message

From: Furey, Eileen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=5AAA3A0EE58047D983897C53C1EB283E-EFUREY]
Sent: 6/26/2018 9:23:35 PM
To: Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Olson, Erik [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b05e7846315e4bf4b9d0df0afdb3eb43-EOlson02]
Subject: RE: EtO risks

Attorney Client / Ex. 5

Eileen

Eileen L. Furey
Deputy Director
Air and Radiation Division
U.S. EPA Region 5
(312) 886-7950

From: Bollweg, George
Sent: Tuesday, June 26, 2018 4:21 PM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Olson, Erik <olson.erik@epa.gov>
Subject: RE: EtO risks

Attorney Client / Ex. 5

From: Sieffert, Margaret
Sent: Tuesday, June 26, 2018 1:37 PM
To: Furey, Eileen <furey.eileen@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Olson, Erik <olson.erik@epa.gov>; Bollweg, George <bollweg.george@epa.gov>
Subject: RE: EtO risks

Attorney Client / Ex. 5

I will let George answer your question on the length of time.

From: Furey, Eileen
Sent: Tuesday, June 26, 2018 11:26 AM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Olson, Erik <olson.erik@epa.gov>; Bolen, Bill <Bolen.Bill@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Biggs, Christopher <biggs.christopher@epa.gov>
Subject: EtO risks

Margaret, George, et al.,

I'm catching up on what I missed last week on the Sterigenics matter.

Attorney Client / Ex. 5

I'm probably mixing apples and oranges, but just checking.

Eileen

Eileen L. Furey
Deputy Director
Air and Radiation Division
U.S. EPA Region 5
(312) 886-7950

Message

From: Delisio, Edward [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9319E61692214D5897DE4181B1D61D67-EDELISIO]
Sent: 6/21/2018 5:48:02 PM
To: Nwia, Jacqueline [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d299b56bd7ef46709fb7465fd1e15466-JNwia]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]
Subject: RE: New Data Table
Attachments: Sterigenics_Public.jpg

Edward Delisio
USEPA Region 5
Chicago, Illinois
ph.312-886-1303
fx. 312-692-2044
delisio.edward@epa.gov

From: Nwia, Jacqueline
Sent: Thursday, June 21, 2018 12:45 PM
To: Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Cc: Delisio, Edward <delisio.edward@epa.gov>
Subject: New Data Table

Attached is a revised data table to better relate to the map that Ed is pulling together. Ed will be sharing a jpeg version of the map shortly.

Sorry for all the revisions.

Jacqueline Nwia
Environmental Scientist
Air Monitoring and Analysis Section
Air Toxics and Assessment Branch
Air and Radiation Division
U.S. Environmental Protection Agency, Region 5
77 West Jackson Blvd. (AR-18)
Chicago, IL 60604
ph. (312) 886-6081
nwia.jacqueline@epa.gov

Message

From: Cohen, Eric [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=545800040A904D3E9CCFA22400B0F5FA-EOCOHEN]
Sent: 8/3/2018 7:38:12 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]
Subject: RE: Sterigenics Badge Sample Data

Thanks Alexis

From: Cain, Alexis
Sent: Friday, August 3, 2018 8:04 AM
To: Bollweg, George <bollweg.george@epa.gov>
Cc: Cohen, Eric <cohen.eric@epa.gov>
Subject: FW: Sterigenics Badge Sample Data

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Nam, Ed
Sent: Thursday, August 02, 2018 2:07 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Subject: FW: Sterigenics Badge Sample Data

Deliberative Process / Ex. 5; Attorney-Client / Ex. 5

Thanks,
-Ed

From: Glover, John
Sent: Thursday, August 02, 2018 1:44 PM
To: Nam, Ed <nam.ed@epa.gov>; Short, Thomas <short.thomas@epa.gov>
Cc: Padovani, Steven <padovani.steven@epa.gov>; Ballotti, Doug <ballotti.douglas@epa.gov>; Durno, Mark <durno.mark@epa.gov>; Newton, Cheryl <Newton.Cheryl@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Subject: RE: Sterigenics Badge Sample Data

Hi Ed,

I've attached the one page results summary as well as copies of the original analytical results to this email. In short, all indoor samples collect for Eto were undetected. The detection limit for the sampling media was 3.7 ppb EtO. The lowest established exposure limit for EtO is a NIOSH recommended limit of 160 ppb.

We also collected two outdoor samples. One of those was undetected, less than 3.7 ppb. A second samples, collected on July 2, 2018, had a concentration of EtO equal to 4.2 ppb. This number is consistent with the concentrations found by the Air Division in their earlier sampling event.

Let me know of you need anything else.

John D. Glover, Jr.
Regional Safety Manager
U.S. EPA Region 5

(312) 886-5301
(312) 692-2504 (fax)

From: Nam, Ed
Sent: Thursday, August 02, 2018 10:51 AM
To: Glover, John <Glover.John@epa.gov>; Short, Thomas <short.thomas@epa.gov>
Cc: Padovani, Steven <padovani.steven@epa.gov>; Ballotti, Doug <ballotti.douglas@epa.gov>; Durno, Mark <durno.mark@epa.gov>; Newton, Cheryl <Newton.Cheryl@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Subject: RE: Sterigenics Badge Sample Data

John, Mark, Tom, Doug,

If this data is QA/QCd, can I please get a briefing on this soon? Who should (or would like) to be at the meeting?

Also, Cathy, Kurt and Jim also would like a summary and may request a briefing afterwards. Can I please ask you to draft a 1 page summary of the testing and the results that I (or Doug or Cheryl) can pass up to Cathy? FYI: The Office of Air and Radiation is also requesting this same writeup, so we can satisfy two needs at once.

Thanks,
-Ed

From: Glover, John
Sent: Thursday, July 26, 2018 1:55 PM
To: Short, Thomas <short.thomas@epa.gov>
Cc: Padovani, Steven <padovani.steven@epa.gov>; Ballotti, Doug <ballotti.douglas@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Subject: RE: Sterigenics Badge Sample Data

Yes, all undetected indoors. < 3.7 ppb. One hit on the outdoor sample at 4.2 ppb. I just got the data a few days ago. I need to send it up through Cheryl Newton for release, but the numbers are just exactly what we expected.

John D. Glover, Jr.
Regional Safety Manager
U.S. EPA Region 5

(312) 886-5301
(312) 692-2504 (fax)

From: Short, Thomas
Sent: Thursday, July 26, 2018 1:54 PM
To: Glover, John <Glover.John@epa.gov>
Cc: Padovani, Steven <padovani.steven@epa.gov>; Ballotti, Doug <ballotti.douglas@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Subject: Sterigenics Badge Sample Data

Good afternoon John,

I understand that we use badges to collect air samples at Willowbrook a little while ago. Do we have the results back yet?

Thomas Richard Short Jr.
Acting Deputy Director
Superfund Division
312-353-8826
short.thomas@epa.gov

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 6/22/2018 11:32:08 AM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: FW: Sterigenics Modeling Parameters

Here is the original email that was sent to Sterigenics with all the modeling parameters. Several tries were made to communicate with Kevin following the requested return date but no responses were received.

From: Sieffert, Margaret
Sent: Wednesday, January 31, 2018 9:56 AM
To: kwagner@sterigenics.com
Subject: Sterigenics Modeling Parameters

Kevin,

Thank you again for agreeing to review the modeling information pertaining to the Willowbrook facility. Per our conversation, below are the questions to try and correct regarding the modeling parameters. We provided some information on the second building for your review but know that EPA only has all emissions coming from one of the buildings.

EPA used google earth to obtain these values. Let us know if Sterigenics is in agreement with them.
-For building #1's address (7775 Quincy St., Willow brook, IL), please verify building #1's corners (lat/long) and building height.
lat/long. Building height of 23.2 feet.
1. 41.748181; -87.939061
2. 41.748163; -87.939499
3. 41.748141; -87.939500
4. 41.748124; -87.940454
5. 41.748006; -87.940453
6. 41.748001; -87.940513
7. 41.747787; -87.940508
8. 41.747786; -87.940444
9. 41.747667; -87.940441
10. 41.747674; -87.939042

EPA would like to separate the emissions by building. Again we used google earth to obtain these values. For building #2's address (830 Midway Dr. Willowbrook, IL), please verify building #2's corners (lat/long) and building height:
lat/long Building height of 12.3 feet
1. 41.748865; -87.941666
2. 41.748877; -87.941221
3. 41.748956; -87.941226
4. 41.748945; -87.941667

Sterigenics/IEPA has the 6 listed stacks in the same location at the following lat/long located withing building #1's area: lat (41.747990) ; long (-87.939730). For modeling purposes, our modeler had to move these stacks 1.0 meter apart as shown below in the table. We are pretty sure that the stacks aren't located at these locations, so if you can provide the lat/long for each of the stacks, or if easier you can mark each stacks location for building 1 and 2 on a map (created using google maps or something similar) and share a screenshot. Also for modeling purposes, EPA has the facility operating 24/7 for 365 days but if this is incorrect, please let us know your annual operating hours.

For each stack that emits EtO, EPA needs the following information: stack lat/long, stack emission rate, stack height, stack exit temperature, stack flow rate, stack diameter, and if the stack is vertical or horizontal. Do you have process fugitive emissions not ducted to a vent or stack not listed in table below? Table below lists the input parameters we used in the modeling. The stack parameter information could be found in a permit application, a stack test, or from manufacturer specifications. With regard to the projected facility emissions after the back vent project, please provide the same information.

Unit ID	Process ID	Stack ID	Lat	Long	2014 Emission Rate (TPY)	Stack Height (m)	Stack Temperature (k)	Stack Exit Velocity (m/s)	Stack Diameter (m)	Vertical or Horizontal Stack?
39469613	45489714	Stack#1	41.747989	-87.939729	0.030576	12.192	308.15	2.29	0.229	V
39469713	45489614	Stack#2	41.747989	-87.939741	0.069888	12.192	308.15	2.29	0.229	V
39469813	45489514	Stack#3	41.747989	-87.939753	1.39776	12.497	310.90	4.69	0.372	V
39469913	45489414	Stack#4	41.747998	-87.939729	0.6552	12.497	310.90	4.69	0.372	V
39470013	45489314	Stack#5	41.748007	-87.939729	0.00056784	10.058	293.00	11.14	0.914	V
39470113	45489214	Stack#6	41.74798	-87.939729	0.62899	12.912	308.15	2.29	0.229	V

Finally, could you provide a property boundary of the facility that includes both buildings? This could be as simple as marking up a map (created using google maps or something similar) and sharing a screenshot.

Not sure how long this will take you to review, but suggests a potential completion date of February 23. If you need additional time, please let me know. Thank you again for your assistance in reviewing the modeling parameters and please don't hesitate to email or call me if you have any questions,

Margaret

Margaret Sieffert | U.S. Environmental Protection Agency R5
Air & Radiation Division | Air Toxics and Assessment Branch
77 W. Jackson Blvd. (AT-18J) | Chicago, IL 60604 | 312.353.1151

Message

From: Nguyen, Phuong [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F07188263D014E06A28762CCF129CE20-PNGUYEN]
Sent: 6/26/2018 8:34:34 PM
To: Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Sterigenics modeling

Yes it's 2014 NATA. This is helpful. We can talk about this later this week. Thanks.

Phuong

From: Sieffert, Margaret
Sent: Tuesday, June 26, 2018 3:13 PM
To: Nguyen, Phuong <Nguyen.Phuong@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Subject: RE: Sterigenics modeling

I think you mean 2014 NATA

Deliberative Process / Ex. 5

-Margaret

From: Nguyen, Phuong
Sent: Tuesday, June 26, 2018 2:08 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Sterigenics Enforcement History

Just to clarify, as discussed during June 21st 's meeting , I am working on the modeling based on our original emission data (2004 NATA).
As for the stack test data, I have not looked at the report. Deliberative Process / Ex. 5
Deliberative Process / Ex. 5

Phuong

Message

From: Hoffman, Kathy [KHoffman@sterigenics.com]
Sent: 6/22/2018 4:12:10 AM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: Meeting Forward Notification: USEPA-Illinois EPA-Sterigenics Discussion of EtO

Your meeting was forwarded

Hoffman, Kathy has forwarded your meeting request to additional recipients.

Meeting

USEPA-Illinois EPA-Sterigenics Discussion of EtO

Meeting Time

Friday, June 22, 2018 10:00 AM - Friday, June 22, 2018 10:45 AM

Recipients

Taylor, Byron F.,Tom Roberts (tcr@vnf.com)

All times listed are in the following time zone: (UTC-06:00) Central Time (US & Canada)

This e-mail and any files transmitted with it may contain privileged and/or confidential information. If you believe this e-mail or any of its attachments were not intended for you, you must not use, distribute, forward, print or copy this e-mail or any attached files. If you have received this e-mail in error, please notify the sender by reply e-mail and then immediately delete the email and all attachments.

Message

From: Bollweg, George [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1592106E02634BB2BDA8CC788B125F2C-GBOLLWEG]
Sent: 6/25/2018 2:44:24 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: rescheduled June 25, 2018 biweekly 1:1
Attachments: 2017SmithDetal.,MnTestingUnderCAATestRule,RiskAssessmentApplication.pdf

FYI

June 25, 2017
Current Toxics and Global Atmosphere Section tasks – George Bollweg

1. Toxicology/risk assessment support

- **Ethylene oxide (EtO):** ongoing activity regarding evaluation of Sterigenics, Willowbrook, IL; R5 air monitoring, conference calls with R5-OAQPS; Willowbrook EtO issues and their intersection with NATA release; OSHA/EPA overlapping concerns in evaluation; etc. I need to catch up.
- **Great Plains Processing (GPP), Luverne MN**: MPCA request for R5 analytic-forensic help in determining cause of yellowing on the sides of houses near GPP, Luverne MN. NEIC obtained remaining sample from MN Dept. of Health (MDH) contact to analyze via SEM, maybe today. NEIC recommended MDH submit MOA for NEIC assistance.
- **AK Steel**, Middletown OH: recent air monitoring of benzene and other pollutants (e.g. PAHs, acids, PM-associated metals); ongoing
- **BWAY Chicago**: TGAS work on this returned to R5 Enforcement for now per Phuong Nguyen
- **IRIS manganese reassessment**: June 19, 2018 IRIS Program call with OAR, OTAQ and R5. IRIS Program staff presented draft Mn Assessment Plan; Marion Hoyer (OTAQ) questioned draft statements in the plan that some EPA-mandated data used to inform Mn PBPK analysis may not be directly usable in RfC revision (see attached paper). Marion later called me regarding whether/how this issue might delay the Mn reassessment; how soon R5 needed a revised Mn RfC; etc.

2. Office of Science Advisor (OSA) cumulative risk assessment (CRA) effort: ongoing OSA writing team work on revising August 2017 draft "CRA GUIDELINES FOR PLANNING AND PROBLEM FORMULATION".

3. Ongoing miscellaneous

- SE Chicago manganese – no later news after recent phone inquiry from Meleah Geertsma (NRDC) regarding Mn in SE Chicago. I think Meleah was taold that communications related to the ongoing SE Chicago Superfund and Air enforcement case go through Nicole Cantello (R5 ORC).
- citizen inquiries
- Fall 2018 States/R5 Air Toxics annual Chicago meeting planning – time is flying

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 6/26/2018 8:15:06 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
CC: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
Subject: RE: Draft Questions for Sterigenics

Deliberative Process / Ex. 5

From: Cain, Alexis
Sent: Tuesday, June 26, 2018 1:00 PM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nguyen, Phuong <Nguyen.Phuong@epa.gov>; Marcus, Danny <marcus.danny@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: Draft Questions for Sterigenics

Here's a draft email to Sterigenics, to be finalized after we talk to OAQPS. Comments/edits welcome. Based on looking at

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

Message

From: Nam, Ed [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A2653F1DDD59470688BA557DD84D9690-NAM, ED]
Sent: 6/21/2018 11:20:38 PM
To: Thiede, Kurt [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3cc09fac5acc4ce1ba689fb2ce70d459-Thiede, Kur]; Kelley, Jeff [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e154fa5a5f744c70aa3da58e3f87aabe-JKelley]; Payne, James [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=61b3204a683041079512b122c580a569-Payne, Jame]
CC: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Sterigenics DRAFT FAQ

Deliberative Process / Ex. 5

From: Thiede, Kurt
Sent: Thursday, June 21, 2018 5:31 PM
To: Nam, Ed <nam.ed@epa.gov>; Kelley, Jeff <kelley.jeff@epa.gov>; Payne, James <payne.james@epa.gov>
Subject: RE: Sterigenics DRAFT FAQ

A good start, and I think we need to get at the likely community concerns. Such as…

Deliberative Process / Ex. 5

Kurt

From: Nam, Ed
Sent: Thursday, June 21, 2018 4:42 PM
To: Payne, James <payne.james@epa.gov>; Thiede, Kurt <thiede.kurt@epa.gov>
Cc: Kelley, Jeff <kelley.jeff@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: Sterigenics DRAFT FAQ

Jim, Kurt,

Attached is the DRAFT website (ported to a word document) that includes the FAQs so far. The actual link is above.
I received an update and OAQPS has not yet edited, but they are getting it now too and I will also send to IEPA.

Thanks,

-Ed

Appointment

From: Mcgaha, Debbie [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=4A078DAF0B514F26909CB566EF453097-DMCGAHA]
Sent: 8/3/2018 3:34:21 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]

Subject: Tentative: FW: EPA/IEPA/Sterigenics Technical Discussion
Location: Personal Phone / Ex. 6

Start: 8/3/2018 4:00:00 PM
End: 8/3/2018 5:00:00 PM
Show Time As: Busy

Message

From: Furey, Eileen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=5AAA3A0EE58047D983897C53C1EB283E-EFUREY]
Sent: 1/4/2018 3:19:10 PM
To: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Jones, Kathy A [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=209210c7644b47d3884e7b202c77ace6-KJones03]
CC: Schwebke, Peggy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0630a26994834c9f8abd6ff9f2000b9f-PSchwebk]; Shaffer, Loretta [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8b2c6bbd3d1e407aac279d330822aefd-LShaffer]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: There are no reports for the ARD Weekly Report to the RA - 1-5-18

Nice summary.

Eileen L. Furey
Deputy Director
Air and Radiation Division
U.S. EPA Region 5
(312) 886-7950

From: Siegel, Kathryn
Sent: Thursday, January 04, 2018 9:00 AM
To: Nam, Ed <nam.ed@epa.gov>; Jones, Kathy A <jones.kathya@epa.gov>
Cc: Furey, Eileen <furey.eileen@epa.gov>; Schwebke, Peggy <schwebke.peggy@epa.gov>; Shaffer, Loretta <Shaffer.Loretta@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Subject: RE: There are no reports for the ARD Weekly Report to the RA - 1-5-18

Please let us know if you have any feedback. Thanks!

Activity: Letters Sent to Ethylene Oxide (EtO) Sources about Possible Cancer Risk

Press Interest/Coverage: None

Issue: On December 22, the Air and Radiation Division sent letters to two sources of EtO—Sterigenics, a commercial sterilizer in Willowbrook, Illinois, and Elé Corporation, a chemical manufacturer in Lyons, Illinois.

The letters inform the two facilities that preliminary modeling indicates that their EtO emissions may be causing high cancer risks. The letters offer the facilities the opportunity to evaluate the modeling and to provide updated modeling inputs, if appropriate, and they express EPA's interest in working with the companies on a voluntary basis to reduce risks to the community.

Illinois EPA has been informed of this activity and will be offered the opportunity to participate in any future discussions with the facilities. The Air and Radiation Division will be evaluating additional EtO sources for possible risk; in December 2016, EPA increased its estimate of EtO cancer potency by approximately 60-fold.

Attachments: None

From: Nam, Ed
Sent: Wednesday, January 03, 2018 4:54 PM
To: Jones, Kathy A <jones.kathya@epa.gov>
Cc: Furey, Eileen <furey.eileen@epa.gov>; Schwebke, Peggy <schwebke.peggy@epa.gov>; Shaffer, Loretta <Shaffer.Loretta@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Breneman, Sara <breneman.sara@epa.gov>; Mooney, John <Mooney.John@epa.gov>
Subject: RE: There are no reports for the ARD Weekly Report to the RA - 1-5-18

I've asked Katie to write one up. Will submit tomorrow by noon.

Thanks
-Ed

From: Jones, Kathy A
Sent: Wednesday, January 03, 2018 4:27 PM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Furey, Eileen <furey.eileen@epa.gov>; Schwebke, Peggy <schwebke.peggy@epa.gov>; Shaffer, Loretta <Shaffer.Loretta@epa.gov>
Subject: There are no reports for the ARD Weekly Report to the RA - 1-5-18

* * * * *
To:
Rowan, Anne; Williams, Felicia; Martinez, Isidra; Marshall, Marjorie

Cc:
Singer, Joshua; Peterson, John; Walts, Alan; Nam, Ed; Furey, Eileen; Breneman, Sara; Mooney, John; Siegel, Kathryn; King-Hackney, Ashadee; Frank, Nathan; Marshall, Sarah; Dickens, Brian; Damico, Genevieve; Aburano, Douglas; Blakley, Pamela; Nelson, Diane; Compher, Michael; Cain, Alexis; Jencius, Michele; Schwebke, Peggy; Shaffer, Loretta

* * * * *

Attached are ARD's Weekly Report to the RA chart and text documents for the week ending January 5.

Message

From: Nam, Ed [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A2653F1DDD59470688BA557DD84D9690-NAM, ED]
Sent: 6/21/2018 11:19:51 PM
To: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
CC: Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]; Nwia, Jacqueline [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d299b56bd7ef46709fb7465fd1e15466-JNwia]; Olson, Erik [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b05e7846315e4bf4b9d0df0afdb3eb43-EOlson02]; Cohen, Eric [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=545800040a904d3e9ccfa22400b0f5fa-Eocohen]
Subject: RE: EtO timeline
Attachments: timeline.docx

Thanks - This is helpful! I've made some changes and put on WORD. I'll send it up to 19th floor now.

Thanks
-Ed

From: Siegel, Kathryn
Sent: Thursday, June 21, 2018 5:31 PM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>; Olson, Erik <olson.erik@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Subject: RE: EtO timeline

Ed, please find an updated timeline below.

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

From: Nam, Ed
Sent: Thursday, June 21, 2018 4:33 PM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>; Olson, Erik <olson.erik@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Subject: RE: EtO timeline

Thanks,

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Thanks
-Ed

From: Siegel, Kathryn
Sent: Thursday, June 21, 2018 3:10 PM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>; Olson, Erik <olson.erik@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Subject: RE: EtO timeline

Ed, please see a slight modification to the timeline below.

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

From: Siegel, Kathryn
Sent: Thursday, June 21, 2018 3:01 PM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>; Olson, Erik <olson.erik@epa.gov>; Cohen,

Eric <cohen.eric@epa.gov>
Subject: EtO timeline

Ed,

Here is a timeline completed to the best of my knowledge. Team, please fill in any gaps. Thank you!

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Katie Siegel, Chief
Air Toxics and Assessment Branch
Air and Radiation Division
U.S. EPA Region 5
siegel.kathryn@epa.gov
(312) 886-3006

Message

From: Bollweg, George [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1592106E02634BB2BDA8CC788B125F2C-GBOLLWEG]
Sent: 8/3/2018 3:22:07 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
CC: Cohen, Eric [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=545800040a904d3e9ccfa22400b0f5fa-Eocohen]
Subject: RE: Sterigenics Badge Sample Data

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

From: Cain, Alexis
Sent: Friday, August 3, 2018 8:04 AM
To: Bollweg, George <bollweg.george@epa.gov>
Cc: Cohen, Eric <cohen.eric@epa.gov>
Subject: FW: Sterigenics Badge Sample Data

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Nam, Ed
Sent: Thursday, August 02, 2018 2:07 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Subject: FW: Sterigenics Badge Sample Data

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Thanks,
-Ed

From: Glover, John
Sent: Thursday, August 02, 2018 1:44 PM
To: Nam, Ed <nam.ed@epa.gov>; Short, Thomas <short.thomas@epa.gov>
Cc: Padovani, Steven <padovani.steven@epa.gov>; Ballotti, Doug <ballotti.douglas@epa.gov>; Durno, Mark <durno.mark@epa.gov>; Newton, Cheryl <Newton.Cheryl@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Subject: RE: Sterigenics Badge Sample Data

Hi Ed,

I've attached the one page results summary as well as copies of the original analytical results to this email. In short, all indoor samples collect for Eto were undetected. The detection limit for the sampling media was 3.7 ppb EtO. The lowest established exposure limit for EtO is a NIOSH recommended limit of 160 ppb.

We also collected two outdoor samples. One of those was undetected, less than 3.7 ppb. A second samples, collected on July 2, 2018, had a concentration of EtO equal to 4.2 ppb. This number is consistent with the concentrations found by the Air Division in their earlier sampling event.

Let me know of you need anything else.

John D. Glover, Jr.
Regional Safety Manager
U.S. EPA Region 5

(312) 886-5301
(312) 692-2504 (fax)

From: Nam, Ed
Sent: Thursday, August 02, 2018 10:51 AM
To: Glover, John <Glover.John@epa.gov>; Short, Thomas <short.thomas@epa.gov>
Cc: Padovani, Steven <padovani.steven@epa.gov>; Ballotti, Doug <ballotti.douglas@epa.gov>; Durno, Mark <durno.mark@epa.gov>; Newton, Cheryl <Newton.Cheryl@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Subject: RE: Sterigenics Badge Sample Data

John, Mark, Tom, Doug,

If this data is QA/QCd, can I please get a briefing on this soon? Who should (or would like) to be at the meeting?

Also, Cathy, Kurt and Jim also would like a summary and may request a briefing afterwards. Can I please ask you to draft a 1 page summary of the testing and the results that I (or Doug or Cheryl) can pass up to Cathy? FYI: The Office of Air and Radiation is also requesting this same writeup, so we can satisfy two needs at once.

Thanks,

-Ed

From: Glover, John
Sent: Thursday, July 26, 2018 1:55 PM
To: Short, Thomas <short.thomas@epa.gov>
Cc: Padovani, Steven <padovani.steven@epa.gov>; Ballotti, Doug <ballotti.douglas@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Subject: RE: Sterigenics Badge Sample Data

Yes, all undetected indoors. < 3.7 ppb. One hit on the outdoor sample at 4.2 ppb. I just got the data a few days ago. I need to send it up through Cheryl Newton for release, but the numbers are just exactly what we expected.

John D. Glover, Jr.
Regional Safety Manager
U.S. EPA Region 5

(312) 886-5301
(312) 692-2504 (fax)

From: Short, Thomas
Sent: Thursday, July 26, 2018 1:54 PM
To: Glover, John <Glover.John@epa.gov>
Cc: Padovani, Steven <padovani.steven@epa.gov>; Ballotti, Doug <ballotti.douglas@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Subject: Sterigenics Badge Sample Data

Good afternoon John,

I understand that we use badges to collect air samples at Willowbrook a little while ago. Do we have the results back yet?

Thomas Richard Short Jr.
Acting Deputy Director
Superfund Division
312-353-8826
short.thomas@epa.gov

217/785-1705

CONSTRUCTION PERMIT
NESHAP SOURCE

PERMITTEE

Sterigenics US, LLC
Attn: Laura Hartman, EHS Manager
2015 Spring Road, Suite 650
Oak Brook, Illinois 60523

Application No.: 18060020 I.D. No.: 043110AAC
Applicant's Designation: Date Received: June 11, 2018
Subject: Control of the Backvents of the Sterilization Chambers
Date Issued: **DRAFT -- June 25, 2018**
Location: 7775 Quincy and 830 Midway, Willowbrook, DuPage County

This Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of control of the backvents of the sterilization chambers, as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1. Introduction

   a. This permit authorizes control of the existing backvents of the five sterilization chambers (SC-1, SC-2, SC-3, SC-4 and SC-5) at Sterigenic's Willowbrook facilities using the existing control systems that control emissions of ethylene oxide from the vacuum pumps and from aeration.

   b. This permit does not authorize changes to the sterilization chambers or other emission units at the source that would increase their capacity or emissions.

   c. For purposes of this permit, the existing sterilization chambers after their backvents are also connected to control systems are referred to as the "affected units."

2. Existing Requirements

   This permit does alter established requirements for the affected units, (i.e., applicable emission standards and requirements for testing, monitoring, recordkeeping and reporting), as identified in Sections 4.1 and 4.2 of the Clean Air Act Permit Program (CAAPP) permit for the source, Permit No. 95120085, issued June 8, 2015. In particular, the affected units will continue to be subject to federal National Emission Standards for Hazardous Air Pollutants (NESHAP) for Ethylene Oxide Emissions from Sterilization Facilities, 40 CFR 63 Subpart O.

3. Nonapplicability Provisions

   This permit is issued based on this project not constituting a major modification for purposes of the state rules for Major Stationary Sources Construction and Modification (MSSCAM), 35 IAC Part 203. This

is because this project is an emission reduction project that will reduce emissions of volatile organic material.

4. Good Air Pollution Control Practices

At all times, the Permittee shall maintain and operate the affected units and associated air pollution control systems in a manner consistent with good air pollution control practices for minimizing emissions.

5. Notification

The Permittee shall notify the Illinois EPA within 30 days after completion of this project. This notification shall include the date that the backvent on each affected unit is first controlled.

6. Authorization to Operate

The Permittee may operate the affected units with backvents ducted to the existing control systems pursuant to this construction permit until the CAAPP permit for the source is revised to address this project. This condition supersedes Standard Condition 6.

Please note that the Illinois EPA has not acted in this permit on Sterigenic's request for enforceable limits on the operation and emissions of its Willowbrook facilities so that this source is not a major source under relevant air pollution control regulations. The Illinois EPA is processing that request as a separate application.

If you have any questions on this permit, please contact Daniel Rowell at 217/558-4368.

Raymond E. Pilapil
Manager, Permit Section
Bureau of Air

REP:DBR:

Message

From: Bollweg, George [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1592106E02634BB2BDA8CC788B125F2C-GBOLLWEG]
Sent: 6/21/2018 10:55:31 PM
To: Smith, Darcie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3ae3c2377efb42879b943db8796ddc05-Smith, Darcie]
CC: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
Subject: RE: Draft internal talking points

Thanks Darcie. I'll be out tomorrow too.

From: Smith, Darcie
Sent: Thursday, June 21, 2018 5:52 PM
To: Bollweg, George <bollweg.george@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>
Cc: Palma, Ted <Palma.Ted@epa.gov>; Langdon, Robin <Langdon.Robin@epa.gov>
Subject: FW: Draft internal talking points

Hi George –

Thanks for the note. Alison Davis is the person to review the talking points and I've copied her on this email. Deliberative Process / Ex. 5 Deliberative Process / Ex. 5 we'll need to pull in some additional folks who are out on annual leave tomorrow.

Thanks,
Darcie

Darcie Smith
U.S. EPA/OAQPS/ATAG
919.541.2076
smith.darcie@epa.gov

From: Bollweg, George
Sent: Thursday, June 21, 2018 6:20 PM
To: Smith, Darcie <Smith.Darcie@epa.gov>; Palma, Ted <Palma.Ted@epa.gov>
Cc: Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: FW: Draft internal talking points

Deliberative Process / Ex. 5

Let us know (ASAP of course) if you have any feedback.

thanks, George B.

From: Sanders, Amy
Sent: Wednesday, June 20, 2018 4:59 PM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Cc: Kelley, Jeff <kelley.jeff@epa.gov>; Newton, Cheryl <Newton.Cheryl@epa.gov>; Colvin, Charles <Colvin.Charles@epa.gov>; Sharon, Scott <sharon.scott@epa.gov>; Glover, John <Glover.John@epa.gov>; Short, Thomas <short.thomas@epa.gov>; Zamora-Ceballos, Maria <Zamora-Ceballos.Maria@epa.gov>
Subject: FW: Draft internal talking points

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Message

From: Bollweg, George [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1592106E02634BB2BDA8CC788B125F2C-GBOLLWEG]
Sent: 8/14/2018 8:11:42 PM
To: Rountree, Jillian [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7d304e5e55a54908b24b17e57ecdbf3c-JRountre]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Furey, Eileen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5aaa3a0ee58047d983897c53c1eb283e-EFurey]; Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Cohen, Eric [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=545800040a904d3e9ccfa22400b0f5fa-Eocohen]
CC: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]
Subject: RE: Redrafted Willowbrook employees communication

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

From: Rountree, Jillian
Sent: Tuesday, August 14, 2018 2:52 PM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Cc: Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Redrafted Willowbrook employees communication

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5
312-353-3849

Some of my email messages and attachments contain information that is privileged, confidential, or prohibited from disclosure under applicable law. If you believe you may have received this message in error, please inform the sender immediately. Further, do not read, print, or distribute any messages or attachments received in error. Immediately delete and otherwise destroy any such messages and attachments. Thank you.

From: Siegel, Kathryn
Sent: Tuesday, August 14, 2018 2:37 PM
To: Furey, Eileen <furey.eileen@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Cc: Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Redrafted Willowbrook employees communication

Last call for edits. I will accept all changes and send the draft letter, plus the 6/22 and 6/27 communications, to Mark and Michelle for their feedback before tomorrow's 2pm meeting.

From: Furey, Eileen
Sent: Tuesday, August 14, 2018 2:33 PM
To: Nam, Ed <nam.ed@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Redrafted Willowbrook employees communication

I recommend attaching both the 6/22 and 6/27 communications to the Willowbrook employees.

Good edits. Make sure you accept all changes before sending.

ELF

Eileen L. Furey
Deputy Director
Air and Radiation Division
U.S. EPA Region 5
(312) 886-7950

From: Nam, Ed
Sent: Tuesday, August 14, 2018 2:28 PM
To: Cohen, Eric <cohen.eric@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Redrafted Willowbrook employees communication

Looks good. I made some minor mods, and inserted Margaret's edit.
Shall we attach John Glover's briefing paper for the RA?

-Ed

From: Cohen, Eric
Sent: Tuesday, August 14, 2018 2:22 PM
To: Furey, Eileen <furey.eileen@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Redrafted Willowbrook employees communication

With Margaret's correction, ok

From: Furey, Eileen
Sent: Tuesday, August 14, 2018 1:52 PM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Subject: Redrafted Willowbrook employees communication

Ed –
Once you're okay with this draft, Katie will send it to ATSDR to make sure they are too. This draft has some tweaks since the earlier draft this morning.
Eileen

Eileen L. Furey
Deputy Director
Air and Radiation Division
U.S. EPA Region 5
(312) 886-7950

Message

From: Nguyen, Phuong [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F07188263D014E06A28762CCF129CE20-PNGUYEN]
Sent: 6/22/2018 11:16:15 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]
Subject: RE: Technical Conference

Alexis – FYI. I am off next Monday be back on Tuesday.

Phuong

From: Cain, Alexis
Sent: Friday, June 22, 2018 5:15 PM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nguyen, Phuong <Nguyen.Phuong@epa.gov>
Subject: FW: Technical Conference

FYI—possible times for a call with Sterigenics. Note that Ed would like us to get together some questions for them. Let's talk about this on Monday.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Nam, Ed
Sent: Friday, June 22, 2018 5:11 PM
To: Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: RE: Technical Conference

Please try to get their questions in advance of the call if possible. And if we have (safe) technical questions that we want to share, we can do that too, please let me pass those through Julie (IEPA) though for concurrence.

-Ed

From: Cain, Alexis
Sent: Friday, June 22, 2018 5:02 PM
To: Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: FW: Technical Conference

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Hoffman, Kathy [mailto:KHoffman@sterigenics.com]
Sent: Friday, June 22, 2018 4:58 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Subject: Technical Conference

Per our discussion this afternoon, following are some time periods next Wednesday and Thursday for an hour call to discuss technical details of this project:

- Wednesday: Anytime from 11am to 2pm
- Thursday: Anytime from 11 to 2:30pm

I am also working with Ramboll to review your EO monitoring and modelling studies. They may have some technical questions on these studies. I have suggested that they provide me a list of any questions and that I can bring this list to our technical conference call too.

Regards,
Kathy

Kathleen Hoffman
Senior Vice President - Global Environmental, Health & Safety and Technical Services
Sterigenics, A Sotera Health Company
2015 Spring Road, Suite 650
Oak Brook, IL 60523
Office: 630.928.1758
khoffman@sterigenics.com

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Message

From: Nam, Ed [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A2653F1DDD59470688BA557DD84D9690-NAM, ED]
Sent: 6/21/2018 10:37:40 PM
To: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]
Subject: FW: Sterigenics DRAFT FAQ

More questions to consider from Kurt.

Not sure we want some of these on the website, but perhaps an internal FAQ too?

Thanks
-Ed

From: Thiede, Kurt
Sent: Thursday, June 21, 2018 5:31 PM
To: Nam, Ed <nam.ed@epa.gov>; Kelley, Jeff <kelley.jeff@epa.gov>; Payne, James <payne.james@epa.gov>
Subject: RE: Sterigenics DRAFT FAQ

A good start, and I think we need to get at the likely community concerns. Such as…

Deliberative Process / Ex. 5

Kurt

From: Nam, Ed
Sent: Thursday, June 21, 2018 4:42 PM
To: Payne, James <payne.james@epa.gov>; Thiede, Kurt <thiede.kurt@epa.gov>
Cc: Kelley, Jeff <kelley.jeff@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: Sterigenics DRAFT FAQ

Jim, Kurt,

Attached is the DRAFT website (ported to a word document) that includes the FAQs so far. The actual link is above.
I received an update and OAQPS has not yet edited, but they are getting it now too and I will also send to IEPA.

Thanks,
-Ed

Message

From: Furey, Eileen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=5AAA3A0EE58047D983897C53C1EB283E-EFUREY]
Sent: 8/14/2018 8:11:06 PM
To: Rountree, Jillian [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7d304e5e55a54908b24b17e57ecdbf3c-JRountre]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Cohen, Eric [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=545800040a904d3e9ccfa22400b0f5fa-Eocohen]
CC: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]
Subject: RE: Redrafted Willowbrook employees communication

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Eileen L. Furey
Deputy Director
Air and Radiation Division
U.S. EPA Region 5
(312) 886-7950

From: Rountree, Jillian
Sent: Tuesday, August 14, 2018 2:52 PM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Cc: Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Redrafted Willowbrook employees communication

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5
312-353-3849
Some of my email messages and attachments contain information that is privileged, confidential, or prohibited from disclosure under applicable law. If you believe you may have received this message in error, please inform the sender immediately. Further, do not read, print, or distribute any messages or attachments received in error. Immediately delete and otherwise destroy any such messages and attachments. Thank you.

From: Siegel, Kathryn
Sent: Tuesday, August 14, 2018 2:37 PM

To: Furey, Eileen <furey.eileen@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Cc: Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Redrafted Willowbrook employees communication

Last call for edits. I will accept all changes and send the draft letter, plus the 6/22 and 6/27 communications, to Mark and Michelle for their feedback before tomorrow's 2pm meeting.

From: Furey, Eileen
Sent: Tuesday, August 14, 2018 2:33 PM
To: Nam, Ed <nam.ed@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Redrafted Willowbrook employees communication

I recommend attaching both the 6/22 and 6/27 communications to the Willowbrook employees.

Good edits. Make sure you accept all changes before sending.

ELF

Eileen L. Furey
Deputy Director
Air and Radiation Division
U.S. EPA Region 5
(312) 886-7950

From: Nam, Ed
Sent: Tuesday, August 14, 2018 2:28 PM
To: Cohen, Eric <cohen.eric@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Redrafted Willowbrook employees communication

Looks good. I made some minor mods, and inserted Margaret's edit.
Shall we attach John Glover's briefing paper for the RA?

-Ed

From: Cohen, Eric
Sent: Tuesday, August 14, 2018 2:22 PM
To: Furey, Eileen <furey.eileen@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Redrafted Willowbrook employees communication

With Margaret's correction, ok

From: Furey, Eileen
Sent: Tuesday, August 14, 2018 1:52 PM
To: Nam, Ed <nam.ed@epa.gov>

Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Subject: Redrafted Willowbrook employees communication

Ed –
Once you're okay with this draft, Katie will send it to ATSDR to make sure they are too. This draft has some tweaks since the earlier draft this morning.
Eileen

Eileen L. Furey
Deputy Director
Air and Radiation Division
U.S. EPA Region 5
(312) 886-7950

Message

From: Siegel, Kathryn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F57A52EFEAD9497CB582B11B8C85F09F-KSIEGE02]
Sent: 1/4/2018 2:59:55 PM
To: Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Jones, Kathy A [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=209210c7644b47d3884e7b202c77ace6-KJones03]
CC: Furey, Eileen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5aaa3a0ee58047d983897c53c1eb283e-EFurey]; Schwebke, Peggy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0630a26994834c9f8abd6ff9f2000b9f-PSchwebk]; Shaffer, Loretta [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8b2c6bbd3d1e407aac279d330822aefd-LShaffer]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: There are no reports for the ARD Weekly Report to the RA - 1-5-18

Please let us know if you have any feedback. Thanks!

Deliberative Process / Ex. 5

From: Nam, Ed
Sent: Wednesday, January 03, 2018 4:54 PM
To: Jones, Kathy A <jones.kathya@epa.gov>
Cc: Furey, Eileen <furey.eileen@epa.gov>; Schwebke, Peggy <schwebke.peggy@epa.gov>; Shaffer, Loretta <Shaffer.Loretta@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Breneman, Sara <breneman.sara@epa.gov>; Mooney, John <Mooney.John@epa.gov>
Subject: RE: There are no reports for the ARD Weekly Report to the RA - 1-5-18

I've asked Katie to write one up. Will submit tomorrow by noon.

Thanks

-Ed

From: Jones, Kathy A
Sent: Wednesday, January 03, 2018 4:27 PM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Furey, Eileen <furey.eileen@epa.gov>; Schwebke, Peggy <schwebke.peggy@epa.gov>; Shaffer, Loretta <Shaffer.Loretta@epa.gov>
Subject: There are no reports for the ARD Weekly Report to the RA - 1-5-18

* * * * *
To:
Rowan, Anne; Williams, Felicia; Martinez, Isidra; Marshall, Marjorie

Cc:
Singer, Joshua; Peterson, John; Walts, Alan; Nam, Ed; Furey, Eileen; Breneman, Sara; Mooney, John; Siegel, Kathryn; King-Hackney, Ashadee; Frank, Nathan; Marshall, Sarah; Dickens, Brian; Damico, Genevieve; Aburano, Douglas; Blakley, Pamela; Nelson, Diane; Compher, Michael; Cain, Alexis; Jencius, Michele; Schwebke, Peggy; Shaffer, Loretta

* * * * *

Attached are ARD's Weekly Report to the RA chart and text documents for the week ending January 5.

Message

From: Siegel, Kathryn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F57A52EFEAD9497CB582B11B8C85F09F-KSIEGE02]
Sent: 12/22/2017 8:42:41 PM
To: Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: EtO Letters

Peggy just confirmed that Ed signed the letters and Janet is mailing them out today. I'm excited that we've reached this milestone and I look forward to the next steps. Thank you!

From: Sieffert, Margaret
Sent: Friday, December 22, 2017 11:07 AM
To: Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: RE: EtO Letters

I am ok with the suggested edits.

Thank you
Margaret

From: Cain, Alexis
Sent: Friday, December 22, 2017 11:02 AM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: EtO Letters

Here are changes based on comments from Peggy and Ed. I did the Ele revisions in redline-strikeout, and the Sterigenics changes I did clean.

Deliberative Process / Ex. 5

After your review, I will finalize changes and send on to Angeline for another printing.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

Message

From: Nam, Ed [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A2653F1DDD59470688BA557DD84D9690-NAM, ED]
Sent: 8/14/2018 7:38:53 PM
To: Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Rollout of Sterigenics data - Willowbrook

No, sorry- we didn't adjust the text. The timing was short (as Cathy wanted a summary) and I was getting the feeling that John didn't want us to modify his work. This upcoming meeting will be our opportunity to clarify the message.

-Ed

From: Bollweg, George
Sent: Tuesday, August 14, 2018 2:12 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Cc: Nam, Ed <nam.ed@epa.gov>
Subject: FW: Rollout of Sterigenics data - Willowbrook

Alexis - FYI we discussed the "ETO Sampling results.docx" wording earlier (Fri 8/3/2018 4:19 PM email from me to you; see also attached "2018ETO Sampling results.docx,GBcomments.docx"). It looks like none of the changes we suggested **Deliberative Process / Ex. 5** were used.

From: Nam, Ed
Sent: Tuesday, August 14, 2018 1:32 PM
To: Glover, John <Glover.John@epa.gov>; Durno, Mark <durno.mark@epa.gov>; Newton, Cheryl <Newton.Cheryl@epa.gov>; Short, Thomas <short.thomas@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Payne, James <payne.james@epa.gov>; Kelley, Jeff <kelley.jeff@epa.gov>; Thiede, Kurt <thiede.kurt@epa.gov>; Singer, Joshua <Singer.Joshua@epa.gov>; Johnson, Mark <johnson.mark@epa.gov>; Colledge, Michelle <Colledge.Michelle@epa.gov>; Ballotti, Doug <ballotti.douglas@epa.gov>
Cc: Bollweg, George <bollweg.george@epa.gov>; Borries, Samuel <borries.samuel@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>
Subject: RE: Rollout of Sterigenics data - Willowbrook

Hi all,

In prep for the meeting tomorrow, I wanted to send around three documents, all background material:

- The first document is Jim Payne's email of June 22 to the employees at Willowbrook.
- The second is the ATSDR letter send to me on July 26 describing the risk to the workers and residents of the area, and recommendations for next steps. Some of you may have already seen this, but I wanted to let you know that the document is close hold right now, though ATSDR will be posting it to their website soon. If you want to quick summary, you can just skip to the conclusions. If you want more detail, p.10 shows some calculations for the chronic (long term) risk for the people who work near the facility.
- The third document is the one page briefing paper from John Glover for Cathy Stepp summarizing the indoor air monitoring that was conducted in July.

Thanks,

-Ed

-----Original Appointment-----
From: Nam, Ed
Sent: Monday, August 13, 2018 4:46 PM
To: Nam, Ed; Glover, John; Durno, Mark; Newton, Cheryl; Short, Thomas; Kathryn Siegel (siegel.kathryn@epa.gov); Cain, Alexis; Eileen Furey (furey.eileen@epa.gov); James Payne (payne.james@epa.gov); Jeff Kelley (kelley.jeff@epa.gov); Kurt Thiede (thiede.kurt@epa.gov); Singer, Joshua; Johnson, Mark; Colledge, Michelle; Doug Ballotti (ballotti.douglas@epa.gov)
Cc: Bollweg, George; Borries, Samuel
Subject: Rollout of Sterigenics data - Willowbrook
When: Wednesday, August 15, 2018 2:00 PM-3:00 PM (UTC-06:00) Central Time (US & Canada).
Where: R5Metcalfe-ConfRm-R1813A/R5-Metcalfe---18th-Floor

Hello,

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Not all of you are required at this meeting. You can delegate if you like.

Thanks,
-Ed

Message

From: Nam, Ed [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A2653F1DDD59470688BA557DD84D9690-NAM, ED]
Sent: 8/14/2018 7:28:10 PM
To: Cohen, Eric [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=545800040a904d3e9ccfa22400b0f5fa-Eocohen]; Furey, Eileen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5aaa3a0ee58047d983897c53c1eb283e-EFurey]
CC: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Rountree, Jillian [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7d304e5e55a54908b24b17e57ecdbf3c-JRountre]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]
Subject: RE: Redrafted Willowbrook employees communication
Attachments: Willowbrook message 8-14-18.v2_EN.DOCX

Looks good. I made some minor mods, and inserted Margaret's edit.
Shall we attach John Glover's briefing paper for the RA?

-Ed

From: Cohen, Eric
Sent: Tuesday, August 14, 2018 2:22 PM
To: Furey, Eileen <furey.eileen@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Redrafted Willowbrook employees communication

With Margaret's correction, ok

From: Furey, Eileen
Sent: Tuesday, August 14, 2018 1:52 PM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Subject: Redrafted Willowbrook employees communication

Ed –
Once you're okay with this draft, Katie will send it to ATSDR to make sure they are too. This draft has some tweaks since the earlier draft this morning.
Eileen

Eileen L. Furey
Deputy Director
Air and Radiation Division

U.S. EPA Region 5
(312) 886-7950

Message

From: Siegel, Kathryn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F57A52EFEAD9497CB582B11B8C85F09F-KSIEGE02]
Sent: 12/22/2017 5:20:05 PM
To: Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: EtO Letters

Deliberative Process / Ex. 5

From: Sieffert, Margaret
Sent: Friday, December 22, 2017 11:07 AM
To: Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: RE: EtO Letters

Deliberative Process / Ex. 5

Thank you
Margaret

From: Cain, Alexis
Sent: Friday, December 22, 2017 11:02 AM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: EtO Letters

Deliberative Process / Ex. 5

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

Message

From: Siegel, Kathryn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F57A52EFEAD9497CB582B11B8C85F09F-KSIEGE02]
Sent: 6/22/2018 10:00:07 PM
To: Coughlin, Justin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0d5e6e54dc1a4c62a892a97810249bef-JCoughlin]
CC: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Compher, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e258cb856e3d4ae6bacca7fa48ca827a-MCompher]
Subject: RE: Sterigenics TRI Facility Report Release.xlsx

Many thanks! Looks great!

From: Coughlin, Justin
Sent: Friday, June 22, 2018 4:59 PM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>
Cc: Cain, Alexis <cain.alexis@epa.gov>; Compher, Michael <compher.michael@epa.gov>
Subject: RE: Sterigenics TRI Facility Report Release.xlsx

Figure attached, best I could get done late on a Friday afternoon. Have a good weekend.

From: Siegel, Kathryn
Sent: Friday, June 22, 2018 3:10 PM
To: Coughlin, Justin <coughlin.justin@epa.gov>
Subject: Sterigenics TRI Facility Report Release.xlsx

Message

From: Sasser, Erika [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=477638FE84004800BFDF8E62FE3CAFC8-ESASSER]
Sent: 6/22/2018 9:11:11 PM
To: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
CC: Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Olson, Erik [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b05e7846315e4bf4b9d0df0afdb3eb43-EOlson02]
Subject: Re: updates on SharePoint

Sounds good. We will regroup Monday morning to provide our comments. Please let me know if you need anything over the weekend.

Sent from my iPhone

On Jun 22, 2018, at 4:57 PM, Siegel, Kathryn <siegel.kathryn@epa.gov> wrote:

> Hi Erika,
>
> We have taken another cut at the Sterigenics Talking Points document, saved on SharePoint. While we would like your concurrence on the entire document, we have highlighted a few specific areas where your feedback is especially sought.
>
> Please call us with any questions. Once finalized, we will use the talking points as a model to update the web copy and any other materials, as necessary.
>
> Thank you for all your help and have a great weekend!
>
> Katie Siegel, Chief
> Air Toxics and Assessment Branch
> Air and Radiation Division
> U.S. EPA Region 5
> siegel.kathryn@epa.gov
> (312) 886-3006

Message

From: Marshall, Sarah [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=72EABF40D65441C794FE33DC2A042026-SMARSH02]
Sent: 6/22/2018 8:00:44 PM
To: Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]
CC: Breneman, Sara [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=abec1970102a45cfb6b842503a9fae06-SBrenema]; Frank, Nathan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd8b205f55ab45dea0c01f08e714f8c1-NFrank02]; Damico, Genevieve [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7d289d99160143fdafee7039dc99807a-GDamico]; Olson, Erik [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b05e7846315e4bf4b9d0df0afdb3eb43-EOlson02]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Sterigenics Enforcement History

Deliberative Process / Ex. 5

Sarah Marshall
Section Chief
Air Enforcement and Compliance Assurance Section (MI/WI)
U.S. Environmental Protection Agency, Region 5
(312) 886-6797

From: Nam, Ed
Sent: Friday, June 22, 2018 2:24 PM
To: Marshall, Sarah <marshall.sarah@epa.gov>
Cc: Breneman, Sara <breneman.sara@epa.gov>; Frank, Nathan <frank.nathan@epa.gov>; Damico, Genevieve <damico.genevieve@epa.gov>; Olson, Erik <olson.erik@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Subject: RE: Sterigenics Enforcement History

Thanks Sarah for the quick and excellent summary. Here's how I shortened it on my timeline. (**Deliberative Process / Ex. 5**
Deliberative Process / Ex. 5 I will port this to the FAQ if you are ok with my summary.

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

From: Marshall, Sarah
Sent: Friday, June 22, 2018 11:35 AM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Breneman, Sara <breneman.sara@epa.gov>; Frank, Nathan <frank.nathan@epa.gov>; Damico, Genevieve <damico.genevieve@epa.gov>; Olson, Erik <olson.erik@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Subject: RE: Sterigenics Enforcement History

I added the IEPA violations below.

Sarah Marshall
Section Chief
Air Enforcement and Compliance Assurance Section (MI/WI)
U.S. Environmental Protection Agency, Region 5
(312) 886-6797

From: Nam, Ed
Sent: Friday, June 22, 2018 10:44 AM
To: Marshall, Sarah <marshall.sarah@epa.gov>
Cc: Breneman, Sara <breneman.sara@epa.gov>; Frank, Nathan <frank.nathan@epa.gov>
Subject: RE: Sterigenics Enforcement History

Thanks Sarah,

It looks like our emails crossed. Can you (or someone else) please add a brief summary of the IEPA enforcement actions that I sent you to the nice talking points below? I assume it corresponds to your last bullet. This is going into the FAQ, so it should be brief and consumable to the public and congressionals.

Thanks,
-Ed

From: Marshall, Sarah
Sent: Friday, June 22, 2018 10:37 AM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Breneman, Sara <breneman.sara@epa.gov>
Subject: Sterigenics Enforcement History

Ed,

There are two facilities in Illinois, Willowbrook and Schaumburg. Those are the only two facilities located in Region 5. There are other facilities in other regions. There is no enforcement history at Schaumburg.

At Willowbrook, EPA's last inspection was in 2002. A violation was found and an unilateral Administrative Order was issued to the facility to correct the following violations of 40 C.F.R. Part 63 Subpart O -Ethylene Oxide Emissions Standards for Sterilization Facilities:

- Failed to install and operate a continuous monitoring system to measure emissions and process parameters from the aeration room vents;

- Failed to monitor emissions from the aeration room; and
- Failed to maintain records.

The case was closed in 2004.

In 2009, there was a determination request submitted to EPA for approval to use the ATT dry bed reactor(SC-2) whenever the AAT Scrubber (SC-1) is under repair or maintenance, therefore a Revised AAT Dry Bed Monitoring Plan for Willowbrook 1 and 11 Facilities.

According to ECHO, at the Willowbrook facility, the last state FCE was in 2016. IEPA reported that there were deviations reported in the Title V certification.

IEPA settled an air enforcement case on 9/18/15 for violations at the Willowbrook facility. There were also violations related to a release of ethylene glycol into the soil and groundwater.

- On October 21, 2013, the facility released 12 pounds of ethylene oxide to the atmosphere.
- IEPA issued a violation notice on November 12, 2013 for the following violations:
    - Caused, threatened or allowed the discharge of ethylene oxide into the atmosphere from Sterilization Chamber B, so as to cause air pollution;
    - Failed to remove Sterilization Chamber B from service or take other actions to cease excess emissions;
    - Failed to reduce ethylene oxide by 99% during the event;
    - Failed to reduce volatile organic matter by 81% during the event.
- The facility paid a $50,000 penalty

There is no IEPA enforcement history at the Schaumburg facility.

Hope this helps.

Sarah Marshall
Section Chief
Air Enforcement and Compliance Assurance Section (MI/WI)
U.S. Environmental Protection Agency, Region 5
(312) 886-6797

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 6/22/2018 7:57:11 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
Subject: Sterigenics TRI emissions
Attachments: Sterigenics TRI Facility Report Release.xlsx

I wasn't sure how to capture the no data or add the 1987-88 data. Here are a couple of graphs to use in the document.

-Margaret

Message

From: Nam, Ed [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A2653F1DDD59470688BA557DD84D9690-NAM, ED]
Sent: 6/21/2018 4:49:51 PM
To: Thiede, Kurt [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3cc09fac5acc4ce1ba689fb2ce70d459-Thiede, Kur]; Payne, James [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=61b3204a683041079512b122c580a569-Payne, Jame]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Kelley, Jeff [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e154fa5a5f744c70aa3da58e3f87aabe-JKelley]; Nelson, Leverett [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2229a07c2cb442b182332d9dcc325f13-LNelson]; Cohen, Eric [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=545800040a904d3e9ccfa22400b0f5fa-Eocohen]; Sasser, Erika [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=477638fe84004800bfdf8e62fe3cafc8-ESASSER]
CC: Ballotti, Doug [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=bb4ccaa2d889499b84d7d4784c0d160a-DBallott]; Short, Thomas [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=06e6366deab241b7b204d2d8415f9cbf-TShort]; Williams, Felicia [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=6527f339ddb0443c8fa6188e5038057d-FWilli02]; Martinez, Isidra [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f8b8fe5bb9774e1daaaf8d45c628a535-IMartine]; Newton, Cheryl [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ae08c2f1c2304a61bf7c01de62f35dbf-Cenewton]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]
Subject: RE: OAQPS briefing on EtO
Attachments: 2014 NATA Results Briefing for OAR R5.pptx

Attached is the briefing material for the noon call with OAQPS.
Sorry for the short notice. OAQPS was scrambling to modify the briefing for us.

Thanks
-Ed

-----Original Appointment-----
From: Stepp, Cathy
Sent: Thursday, June 21, 2018 8:47 AM
To: Stepp, Cathy; Thiede, Kurt; Payne, James; Nam, Ed; Siegel, Kathryn; Cain, Alexis; Kelley, Jeff; Nelson, Leverett; Cohen, Eric; Sasser, Erika
Subject: OAQPS briefing on EtO
When: Thursday, June 21, 2018 12:00 PM-1:00 PM (UTC-06:00) Central Time (US & Canada).
Where: RA's Small Conference Room - **Conference Line/Code / Ex. 6**

Message

From: Nam, Ed [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A2653F1DDD59470688BA557DD84D9690-NAM, ED]
Sent: 7/17/2018 11:24:53 PM
To: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
CC: Furey, Eileen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5aaa3a0ee58047d983897c53c1eb283e-EFurey]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: Re: Follow up from Sr Staff Mtg

Thanks. We think Morgan needed it sooner. I will try to buy you time
Ed

Sent from my iPhone

On Jul 17, 2018, at 2:41 PM, Siegel, Kathryn <siegel.kathryn@epa.gov> wrote:

Hi Ed,

Alexis has a team meeting on 7/30 and part of the agenda is to identify a process. In lean fashion, we want to have staff input and buy-in when selecting a process. Sound good?

-----Original Appointment-----
From: Nam, Ed
Sent: Monday, July 16, 2018 3:44 PM
To: Furey, Eileen; Mooney, John; Siegel, Kathryn; Breneman, Sara; Marshall, Sarah
Subject: Canceled: Follow up from Sr Staff Mtg
When: Monday, July 16, 2018 4:00 PM-4:15 PM (UTC-06:00) Central Time (US & Canada).
Where: Ed's office
Importance: High

We don't need meeting this afternoon. I've connected with Katie on the Sterigenics follow up item, and I'm emailing others (Nathan on Canada trip, Brian on AMG followup mtg). Just a couple of other points to share:

1- There is no Sr Staff mtg this Thursday so I will not need updated on Thursday morning.
2- Katie, I need a project from Alexis for ELMS training. This is not a Kaizen event, but there will be a map of the current state of a project.
3- **Deliberative Process / Ex. 5**

Thanks.
-Ed

Message

From: King, Steven [Steven.King@Illinois.gov]
Sent: 7/17/2018 9:34:57 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Modeling files

Thank you, yes, this should be enough to get me familiarized.

Steve

From: Cain, Alexis [mailto:cain.alexis@epa.gov]
Sent: Tuesday, July 17, 2018 3:08 PM
To: King, Steven <Steven.King@Illinois.gov>
Subject: [External] FW: Modeling files

Hi Steven—I think these are the files you're looking for. If not, let me know.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Cain, Alexis
Sent: Friday, June 22, 2018 9:12 AM
To: 'Hoffman, Kathy' <KHoffman@sterigenics.com>
Cc: Nguyen, Phuong <Nguyen.Phuong@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: Modeling files

Kathy—here are our modeling input/output files.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

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Message

From: Sasser, Erika [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=477638FE84004800BFDF8E62FE3CAFC8-ESASSER]
Sent: 6/21/2018 4:45:41 PM
To: Stepp, Cathy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=befdafc0fa1a425eae232f60ad9bda1d-Stepp, Cath]; Thiede, Kurt [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3cc09fac5acc4ce1ba689fb2ce70d459-Thiede, Kur]; Payne, James [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=61b3204a683041079512b122c580a569-Payne, Jame]; Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Kelley, Jeff [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e154fa5a5f744c70aa3da58e3f87aabe-JKelley]; Nelson, Leverett [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2229a07c2cb442b182332d9dcc325f13-LNelson]; Cohen, Eric [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=545800040a904d3e9ccfa22400b0f5fa-Eocohen]
Subject: RE: OAQPS briefing on EtO
Attachments: 2014 NATA Results Briefing for OAR R5.pptx

-----Original Appointment-----
From: Stepp, Cathy
Sent: Thursday, June 21, 2018 9:47 AM
To: Stepp, Cathy; Thiede, Kurt; Payne, James; Nam, Ed; Siegel, Kathryn; Cain, Alexis; Kelley, Jeff; Nelson, Leverett; Cohen, Eric; Sasser, Erika
Subject: OAQPS briefing on EtO
When: Thursday, June 21, 2018 12:00 PM-1:00 PM (UTC-06:00) Central Time (US & Canada).
Where: RA's Small Conference Room - **Conference Line/Code / Ex. 6**

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 7/2/2018 2:39:56 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Sterigenics - Met data & Plot files

My preferences would be 7/16, 7/18 and 7/23.

From: Cain, Alexis
Sent: Monday, July 02, 2018 9:33 AM
To: Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: FW: Sterigenics - Met data & Plot files

Sterigenics suggests the weeks of July 16 and 23 (excluding the 19th and 25th). I would like to exclude the 24th.

So . . . 7/16, 17, 18, 20, 23, 26, 27. Any preferences?

We probably should think also about who is essential. Do we want to take 12 people on a plant tour? I think Margaret is essential. I'd like to go, but I'm not essential. Danny? Jackie?

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Hoffman, Kathy [mailto:KHoffman@sterigenics.com]
Sent: Friday, June 29, 2018 4:25 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Subject: RE: Sterigenics - Met data & Plot files

Alexis:

Thank you very much for this data. I have forwarded it to our Ramboll consultants for further review. I have been conducting a training seminar this week and this is my first day in the office catching up on emails.

As for dates of where you might come out to Willowbrook, I am on vacation next week and in Cleveland most of the following week for corporate meetings. Could we schedule something the week of July 16th or 23rd? The facility is available these weeks except they have all-day customer audits on Thursday, July 19th and Wednesday, July 25th. I would like to prepare a more detailed description of our operations and emissions and then tour the facility. If needed, I could have someone from Engineering present and they can show the status of the backvent project too. We should be quite a bit into the project by then.

As mentioned, I am out of the office next week but will be checking emails.

Regards,
Kathy

From: Cain, Alexis [mailto:cain.alexis@epa.gov]
Sent: Wednesday, June 27, 2018 4:13 PM
To: Hoffman, Kathy
Subject: Sterigenics - Met data & Plot files

Hello Kathleen—we're very pleased to be working cooperatively with you to address ethylene oxide issues; thank you for that.

I've attached a file with the five-year meteorological data used for the modeling, the plot files for the period (five-year) average, 1-hr average, and 8- hr average, as well as the met data collected during our three-day sampling period.

Could you suggest some days when we might come out to Willowbrook for a presentation and tour? It would be great to connect voices to faces, as well as to see your operations.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov
This e-mail and any files transmitted with it may contain privileged and/or confidential information. If you believe this e-mail or any of its attachments were not intended for you, you must not use, distribute, forward, print or copy this e-mail or any attached files. If you have received this e-mail in error, please notify the sender by reply e-mail and then immediately delete the email and all attachments.

Message

From: Bollweg, George [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1592106E02634BB2BDA8CC788B125F2C-GBOLLWEG]
Sent: 8/14/2018 7:11:33 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
CC: Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]
Subject: FW: Rollout of Sterigenics data - Willowbrook
Attachments: ATSDR Sterigenics EtO Consult Letter-final.pdf; ETO Sampling results.docx; Willowbrook Air Monitoring Data; 2018ETO Sampling results.docx,GBcomments.docx

Alexis - FYI we discussed the "ETO Sampling results.docx" wording earlier (Fri 8/3/2018 4:19 PM email from me to you; see also attached "2018ETO Sampling results.docx,GBcomments.docx"). It looks like none of the changes we suggested Deliberative Process / Ex. 5 were used.

From: Nam, Ed
Sent: Tuesday, August 14, 2018 1:32 PM
To: Glover, John <Glover.John@epa.gov>; Durno, Mark <durno.mark@epa.gov>; Newton, Cheryl <Newton.Cheryl@epa.gov>; Short, Thomas <short.thomas@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Payne, James <payne.james@epa.gov>; Kelley, Jeff <kelley.jeff@epa.gov>; Thiede, Kurt <thiede.kurt@epa.gov>; Singer, Joshua <Singer.Joshua@epa.gov>; Johnson, Mark <johnson.mark@epa.gov>; Colledge, Michelle <Colledge.Michelle@epa.gov>; Ballotti, Doug <ballotti.douglas@epa.gov>
Cc: Bollweg, George <bollweg.george@epa.gov>; Borries, Samuel <borries.samuel@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>
Subject: RE: Rollout of Sterigenics data - Willowbrook

Hi all,

Deliberative Process / Ex. 5

-----Original Appointment-----
From: Nam, Ed
Sent: Monday, August 13, 2018 4:46 PM
To: Nam, Ed; Glover, John; Durno, Mark; Newton, Cheryl; Short, Thomas; Kathryn Siegel (siegel.kathryn@epa.gov); Cain, Alexis; Eileen Furey (furey.eileen@epa.gov); James Payne (payne.james@epa.gov); Jeff Kelley (kelley.jeff@epa.gov); Kurt Thiede (thiede.kurt@epa.gov); Singer, Joshua; Johnson, Mark; Colledge, Michelle; Doug Ballotti (ballotti.douglas@epa.gov)
Cc: Bollweg, George; Borries, Samuel

Subject: Rollout of Sterigenics data - Willowbrook
When: Wednesday, August 15, 2018 2:00 PM-3:00 PM (UTC-06:00) Central Time (US & Canada).
Where: R5Metcalfe-ConfRm-R1813A/R5-Metcalfe---18th-Floor

Hello,

Deliberative Process / Ex. 5

Not all of you are required at this meeting. You can delegate if you like.

Thanks,
-Ed

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 7/2/2018 2:35:22 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
CC: Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]
Subject: Other EtO sources in R5
Attachments: Other EtO Sources RA Briefing.pptx; 2018July02-Draft-OtherEtOSources-RABriefing.docx

Alexis, I edited the documents based on George's and your comments. Please share with others.

-Margaret

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 6/21/2018 4:26:35 PM
To: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]; Nwia, Jacqueline [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d299b56bd7ef46709fb7465fd1e15466-JNwia]
Subject: FW: Heads up - For R5 mtg at 1
Attachments: R5 Elevated Risk.pptx

Importance: High

Darcie just shared this with me.

From: Smith, Darcie
Sent: Thursday, June 21, 2018 11:22 AM
To: Witt, Jon <Witt.Jon@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: Heads up - For R5 mtg at 1
Importance: High

For your advance info – we're adding this slide.

Darcie Smith
U.S. EPA/OAQPS/ATAG
919.541.2076
smith.darcie@epa.gov

From: Palma, Ted
Sent: Thursday, June 21, 2018 12:08 PM
To: Langdon, Robin <Langdon.Robin@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>
Cc: Strum, Madeleine <Strum.Madeleine@epa.gov>
Subject: RE: Emergency briefing

Here is what Madie and I put together for R5

Ted Palma
USEPA
OAQPS/HEID/ATAG
MD C539-02
RTP, NC 27711

919-541-5470 (work)
palma.ted@epa.gov

Message

From: Rountree, Jillian [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7D304E5E55A54908B24B17E57ECDBF3C-JROUNTRE]
Sent: 8/14/2018 7:10:37 PM
To: Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]
CC: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
Subject: RE: Redrafted Willowbrook employees communication

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5
312-353-3849
Some of my email messages and attachments contain information that is privileged, confidential, or prohibited from disclosure under applicable law. If you believe you may have received this message in error, please inform the sender immediately. Further, do not read, print, or distribute any messages or attachments received in error. Immediately delete and otherwise destroy any such messages and attachments. Thank you.

From: Sieffert, Margaret
Sent: Tuesday, August 14, 2018 2:08 PM
To: Furey, Eileen <furey.eileen@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Subject: RE: Redrafted Willowbrook employees communication

Deliberative Process / Ex. 5 & Attorney Client / Ex. 5

From: Furey, Eileen
Sent: Tuesday, August 14, 2018 1:52 PM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Cohen, Eric <cohen.eric@epa.gov>
Subject: Redrafted Willowbrook employees communication

Ed –
Once you're okay with this draft, Katie will send it to ATSDR to make sure they are too. This draft has some tweaks since the earlier draft this morning.
Eileen

Eileen L. Furey

Deputy Director
Air and Radiation Division
U.S. EPA Region 5
(312) 886-7950

Message

From: Koerber, Mike [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9C513901D4FD49F9AB101A6F7A7A863E-KOERBER, MIKE]
Sent: 6/26/2018 4:12:07 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
CC: Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Marcus, Danny [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a34c75d25a6243e68733a8ee7e2ddf82-DMarcus]; Sasser, Erika [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=477638fe84004800bfdf8e62fe3cafc8-ESASSER]; Shappley, Ned [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5fc7fde372054ab5ac38f24b9072b73d-Shappley, N]; Jones, Rhea [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8d213054092e4312bf031a52d13aafb8-RJONES02]; Smith, Darcie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3ae3c2377efb42879b943db8796ddc05-Smith, Darcie]; Langdon, Robin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dfd5fbd46a7494c82e49aeb435bfa8d-Langdon, Robin]
Subject: Re: Monitoring Options for R5

Thanks, Alexis. Erika or Chet will be back in touch shortly about a call.

Mike

Sent from my iPhone

On Jun 26, 2018, at 11:29 AM, Cain, Alexis <cain.alexis@epa.gov> wrote:

> Thanks Mike. This is great. Deliberative Process / Ex. 5
> Deliberative Process / Ex. 5
> Deliberative Process / Ex. 5 Could we find a time? Not sure who on your end needs to be involved—Margaret is essential on our end, and she's available except for say 11:45-12:15 Central time. I'd like to participate if possible as well as Danny Marcus, but I'm not essential.
> Alexis Cain
> USEPA-Region 5
> (312) 886-7018
> cain.alexis@epa.gov
>
> ---
>
> **From:** Koerber, Mike
> **Sent:** Monday, June 25, 2018 4:12 PM
> **To:** Nam, Ed <nam.ed@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
> **Cc:** Sasser, Erika <Sasser.Erika@epa.gov>; Shappley, Ned <Shappley.Ned@epa.gov>; Jones, Rhea <Jones.Rhea@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>; Langdon, Robin <Langdon.Robin@epa.gov>; Shappley, Ned <Shappley.Ned@epa.gov>
> **Subject:** Monitoring Options for R5

As a follow-up to conversations last week, attached please find our thoughts about monitoring. Let me know if you have any questions. If you wish, then we'd be happy to talk through this on Tuesday.

Mike

Message

From: Siegel, Kathryn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F57A52EFEAD9497CB582B11B8C85F09F-KSIEGE02]
Sent: 10/3/2018 1:32:28 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]
Subject: FW: Weinstock, Lewis shared "Sampling Plan - EtO - Sterigenics Willowbrook - Draft" with you.

From: Weinstock, Lewis
Sent: Wednesday, October 03, 2018 7:29 AM
To: Nwia, Jacqueline <nwia.jacqueline@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Compher, Michael <compher.michael@epa.gov>
Subject: Weinstock, Lewis shared "Sampling Plan - EtO - Sterigenics Willowbrook - Draft" with you.

Hi - here is our working draft of Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

This link only works for the direct recipients of this message.

Sampling Plan - EtO - Sterigenics Willowbrook - Draft

Open

Microsoft OneDrive

Microsoft respects your privacy. To learn more, please read our Privacy Statement.
Microsoft Corporation, One Microsoft Way, Redmond, WA 98052

Appointment

From: Microsoft Outlook [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=MICROSOFTEXCHANGE329E71EC88AE4615BBC36AB6CE41109EF7088051]
Sent: 6/21/2018 4:14:23 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]

Subject: Meeting Forward Notification: Sterigenics Permit
Location: Katie's Office

Start: 6/21/2018 7:00:00 PM
End: 6/21/2018 7:30:00 PM

Recurrence: (none)

Your meeting was forwarded

Damico, Genevieve has forwarded your meeting request to additional recipients.

Meeting

Sterigenics Permit

Meeting Time

Thursday, June 21, 2018 2:00 PM-2:30 PM.

Recipients

Isom, Kristen

All times listed are in the following time zone: (UTC-06:00) Central Time (US & Canada)

Sent by Microsoft Exchange Server

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 10/3/2018 1:00:43 PM
To: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Nguyen, Phuong [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f07188263d014e06a28762ccf129ce20-PNguyen]
Subject: Sterigenics modeling
Attachments: Sterigenics Willowbrook Emissions and Model Inputs.xlsx

This file was sent to OAQPS late yesterday. Phuong I can send you the AERMOD input file they sent as well. The final stack test hasn't been submitted. No meetings has been scheduled to discuss the modeling. Phuong and Alexis, I will invite you to any that I become aware of.

-Margaret

Message

From: Furey, Eileen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=5AAA3A0EE58047D983897C53C1EB283E-EFUREY]
Sent: 8/14/2018 6:51:35 PM
To: Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]
CC: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Rountree, Jillian [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7d304e5e55a54908b24b17e57ecdbf3c-JRountre]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Cohen, Eric [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=545800040a904d3e9ccfa22400b0f5fa-Eocohen]
Subject: Redrafted Willowbrook employees communication
Attachments: Willowbrook message 8-14-18.v2.docx

Ed –
Once you're okay with this draft, Katie will send it to ATSDR to make sure they are too. This draft has some tweaks since the earlier draft this morning.
Eileen

Eileen L. Furey
Deputy Director
Air and Radiation Division
U.S. EPA Region 5
(312) 886-7950

Message

From: Bollweg, George [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1592106E02634BB2BDA8CC788B125F2C-GBOLLWEG]
Sent: 6/28/2018 7:17:42 PM
To: Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Other EtO Sources RA Briefing
Attachments: 2018June28-Draft'OtherEtOSources'RABriefing,GBcomments.docx

Both look OK to me. **Deliberative Process / Ex. 5**

From: Sieffert, Margaret
Sent: Thursday, June 28, 2018 11:07 AM
To: Cain, Alexis <cain.alexis@epa.gov>; Bollweg, George <bollweg.george@epa.gov>
Subject: Other EtO Sources RA Briefing

I have drafted the following (similar to what R3 shared with Jim for their sources). Let me know what you think.

-Margaret

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 6/26/2018 3:25:48 PM
To: Marcus, Danny [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a34c75d25a6243e68733a8ee7e2ddf82-DMarcus]
CC: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Monitoring Options for R5

Per our phone conversation, I could not get through to OAQPS via phone. Alexis will try the management side to get an answer for you.

-Margaret

From: Marcus, Danny
Sent: Tuesday, June 26, 2018 10:04 AM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>
Cc: Damico, Genevieve <damico.genevieve@epa.gov>
Subject: RE: Monitoring Options for R5

All,

Deliberative Process / Ex. 5

Danny.

From: Sieffert, Margaret
Sent: Tuesday, June 26, 2018 9:54 AM
To: Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>
Cc: Marcus, Danny <marcus.danny@epa.gov>; Damico, Genevieve <damico.genevieve@epa.gov>
Subject: RE: Monitoring Options for R5

The 2003/2005/2016 stack tests were specific to the process (aeration room or chamber each for willowbrook I and II). They has 3 runs with each run being 1 hour which is typical of stack tests.

From: Cain, Alexis
Sent: Tuesday, June 26, 2018 9:29 AM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>
Cc: Marcus, Danny <marcus.danny@epa.gov>; Damico, Genevieve <damico.genevieve@epa.gov>
Subject: RE: Monitoring Options for R5

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Alexis Cain
USEPA-Region 5
(312) 886-7018

cain.alexis@epa.gov

From: Cain, Alexis
Sent: Tuesday, June 26, 2018 8:57 AM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>
Cc: Marcus, Danny <marcus.danny@epa.gov>; Damico, Genevieve <damico.genevieve@epa.gov>
Subject: RE: Deliberative Process / Ex. 5

Tieing in Danny and Genevieve.

Let's make sure that we have all of our questions lined up, then give Ned a call.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Sieffert, Margaret
Sent: Tuesday, June 26, 2018 8:52 AM
To: Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>
Subject: RE: Monitoring Options for R5

Deliberative Process / Ex. 5

-Margaret

From: Cain, Alexis
Sent: Tuesday, June 26, 2018 8:12 AM
To: Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>
Subject: RE: Monitoring Options for R5

Deliberative Process / Ex. 5

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Koerber, Mike
Sent: Monday, June 25, 2018 4:12 PM
To: Nam, Ed <nam.ed@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Cc: Sasser, Erika <Sasser.Erika@epa.gov>; Shappley, Ned <Shappley.Ned@epa.gov>; Jones, Rhea <Jones.Rhea@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>; Langdon, Robin <Langdon.Robin@epa.gov>; Shappley, Ned <Shappley.Ned@epa.gov>
Subject: Monitoring Options for R5

As a follow-up to conversations last week, attached please find our thoughts about monitoring. Let me know if you have any questions. If you wish, then we'd be happy to talk through this on Tuesday.

Mike

Message

From: Siegel, Kathryn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F57A52EFEAD9497CB582B11B8C85F09F-KSIEGE02]
Sent: 10/3/2018 4:34:18 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: FW: URGENT, DUE by 2:00 p.m.: review draft R5 OA
Attachments: DRAFT R5 FY 2018 Organizational Assessment 10-3-18 .docx

Importance: High

This look okay for Sterigenics?

Deliberative Process / Ex. 5

From: Schwebke, Peggy
Sent: Wednesday, October 03, 2018 11:14 AM
To: Breneman, Sara <breneman.sara@epa.gov>; Mooney, John <Mooney.John@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Cc: Nam, Ed <nam.ed@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Subject: URGENT, DUE by 2:00 p.m.: review draft R5 OA
Importance: High

Please review the attached draft Region 5 organizational assessment and let me know **by 2:00 p.m. today** if anything for our division is incorrect or you have any concerns about the way they worded our content.

Thanks. Almost done!

Peggy J. Schwebke
Division Program Analyst/Planner
Air & Radiation Division, Immediate Office
U.S. EPA, Region 5
phone: (312) 353-9309

From: Jencius, Morgan
Sent: Wednesday, October 03, 2018 11:08 AM
To: Taylor, Jori <taylor.jori@epa.gov>; Schwebke, Peggy <schwebke.peggy@epa.gov>; Hogan-Chereskin, Jean <hogan-chereskin.jean@epa.gov>; Russ, Michael <russ.michael@epa.gov>; Fisseha, Ashley <Fisseha.Ashley@epa.gov>
Cc: Holst, Linda <holst.linda@epa.gov>; Baltazar, Debbie <baltazar.debbie@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Hyde, Tinka <hyde.tinka@epa.gov>; Harris, Michael <harris.michael@epa.gov>; Korleski, Christopher <korleski.christopher@epa.gov>; Nettesheim, Todd <nettesheim.todd@epa.gov>; Ballotti, Doug <ballotti.douglas@epa.gov>; Short, Thomas <short.thomas@epa.gov>; Maldonado, Mayra <maldonado.mayra@epa.gov>; Kaplan, Robert <kaplan.robert@epa.gov>
Subject: ACTION - red flag review: R5 FY 2018 Organizational Assessment DRAFT 10-3-18

Please identify your division/office content, review for accuracy and share any red flag comments by 3 pm this afternoon.

Thanks to everyone for their content and quick replies. Region 5 had another great year of accomplishments!

Message

From: Dunning, Angeline [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D8A0B23D55264C3BA495ECD2FB35C28C-ADUNNING]
Sent: 12/21/2017 4:08:15 PM
To: Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]
CC: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: Re: EtO Letters
Attachments: Ele EtO letter.doc; Sterigenics EtO letter .doc

Alexis, for your review. Thanks

ANGELINE DUNNING
Administrative Program Assistant
Toxics & Global Atmosphere Section
312.886.0274
dunning.angeline@epa.gov

From: Sieffert, Margaret
Sent: Thursday, December 21, 2017 9:47 AM
To: Dunning, Angeline
Cc: Cain, Alexis
Subject: RE: EtO Letters

I was unsure of what all your highlighted items meant. I did my best given that the style manual is old and still references Susan Hedman. If I missed anything please just make the edit. Once you are done, you can forward to Alexis and Katie. I will be OK with any additional style edits.

-Margaret

From: Dunning, Angeline
Sent: Thursday, December 21, 2017 8:27 AM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Cc: Cain, Alexis <cain.alexis@epa.gov>
Subject: Re: EtO Letters

Margaret, I have highlighted my edits on the Sterigenics letter and provided the style manual for you as well. It can also be found on the SharePoint site as well. Please apply the edits to both letters and resend to me. Thanks!

ANGELINE DUNNING
Administrative Program Assistant
Toxics & Global Atmosphere Section
312.886.0274
dunning.angeline@epa.gov

From: Sieffert, Margaret
Sent: Thursday, December 21, 2017 7:48 AM
To: Dunning, Angeline
Cc: Cain, Alexis
Subject: EtO Letters

Per Katie's recent email, here are 2 letters that need to be mailed by tomorrow. Please review for correct style. I will stop by and sign a concurrence sheet so the letters once ready can be sent through the signature chain.

Thanks, Margaret

Appointment

From: Siegel, Kathryn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F57A52EFEAD9497CB582B11B8C85F09F-KSIEGE02]
Sent: 6/21/2018 3:48:08 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]

Subject: Accepted: Sterigenics Permit
Location: Katie's Office

Start: 6/21/2018 7:00:00 PM
End: 6/21/2018 7:30:00 PM
Show Time As: Busy

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 12/21/2017 3:47:35 PM
To: Dunning, Angeline [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d8a0b23d55264c3ba495ecd2fb35c28c-ADunning]
CC: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: EtO Letters
Attachments: Sterigenics EtO letter .doc; Ele EtO letter.doc

I was unsure of what all your highlighted items meant. I did my best given that the style manual is old and still references Susan Hedman. If I missed anything please just make the edit. Once you are done, you can forward to Alexis and Katie. I will be OK with any additional style edits.

-Margaret

From: Dunning, Angeline
Sent: Thursday, December 21, 2017 8:27 AM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Cc: Cain, Alexis <cain.alexis@epa.gov>
Subject: Re: EtO Letters

Margaret, I have highlighted my edits on the Sterigenics letter and provided the style manual for you as well. It can also be found on the SharePoint site as well. Please apply the edits to both letters and resend to me. Thanks!

ANGELINE DUNNING
Administrative Program Assistant
Toxics & Global Atmosphere Section
312.886.0274
dunning.angeline@epa.gov

From: Sieffert, Margaret
Sent: Thursday, December 21, 2017 7:48 AM
To: Dunning, Angeline
Cc: Cain, Alexis
Subject: EtO Letters

Per Katie's recent email, here are 2 letters that need to be mailed by tomorrow. Please review for correct style. I will stop by and sign a concurrence sheet so the letters once ready can be sent through the signature chain.

Thanks, Margaret

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 6/26/2018 2:38:13 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
CC: Nguyen, Phuong [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f07188263d014e06a28762ccf129ce20-PNguyen]
Subject: FW: Sterigenics modeling questions

Here is what I sent to Phuong this morning. Deliberative Process / Ex. 5
Deliberative Process / Ex. 5

From: Nguyen, Phuong
Sent: Tuesday, June 26, 2018 9:25 AM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: RE: Sterigenics modeling questions

I think this would work for now. If they have additional questions we can address later. I will forward it to Alexis .

From: Sieffert, Margaret
Sent: Tuesday, June 26, 2018 9:05 AM
To: Nguyen, Phuong <Nguyen.Phuong@epa.gov>
Subject: Sterigenics modeling questions

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

From: Sieffert, Margaret
Sent: Wednesday, January 31, 2018 9:56 AM
To: kwagner@sterigenics.com
Subject: Sterigenics Modeling Parameters

Kevin,

Thank you again for agreeing to review the modeling information pertaining to the Willowbrook facility. Per our conversation, below are the questions to try and correct regarding the modeling parameters. We provided some information on the second building for your review but know that EPA only has all emissions coming from one of the buildings.

EPA used google earth to obtain these values. Let us know if Sterigenics is in agreement with them.
-For building #1's address (7775 Quincy St., Willow brook, IL), please verify building #1's corners (lat/long) and building height.
lat/long. Building height of 23.2 feet.
1. 41.748181; -87.939061
2. 41.748163; -87.939499
3. 41.748141; -87.939500
4. 41.748124; -87.940454
5. 41.748006; -87.940453
6. 41.748001; -87.940513
7. 41.747787; -87.940508
8. 41.747786; -87.940444
9. 41.747667; -87.940441
10. 41.747674; -87.939042

EPA would like to separate the emissions by building. Again we used google earth to obtain these values. For building #2's address (830 Midway Dr. Willowbrook, IL), please verify building #2's corners (lat/long) and building height:
lat/long Building height of 12.3 feet

1. 41.748865; -87.941666
2. 41.748877; -87.941221
3. 41.748956; -87.941226
4. 41.748945; -87.941667

Sterigenics/IEPA has the 6 listed stacks in the same location at the following lat/long located withing building #1's area: lat (41.747990) ; long (-87.939730). For modeling purposes, our modeler had to move these stacks 1.0 meter apart as shown below in the table. We are pretty sure that the stacks aren't located at these locations, so if you can provide the lat/long for each of the stacks, or if easier you can mark each stacks location for building 1 and 2 on a map (created using google maps or something similar) and share a screenshot. Also for modeling purposes, EPA has the facility operating 24/7 for 365 days but if this is incorrect, please let us know your annual operating hours.

For each stack that emits EtO, EPA needs the following information: stack lat/long, stack emission rate, stack height, stack exit temperature, stack flow rate, stack diameter, and if the stack is vertical or horizontal. Do you have process fugitive emissions not ducted to a vent or stack not listed in table below? Table below lists the input parameters we used in the modeling. The stack parameter information could be found in a permit application, a stack test, or from manufacturer specifications. With regard to the projected facility emissions after the back vent project, please provide the same information.

Unit ID	Process ID	Stack ID	Lat	Long	2014 Emission Rate (TPY)	Stack Height (m)	Stack Temperature (k)	Stack Exit Velocity (m/s)	Stack Diameter (m)	Vertical or Horizontal Stack?
39469613	45489714	Stack#1	41.747989	-87.939729	0.030576	12.192	308.15	2.29	0.229	V
39469713	45489614	Stack#2	41.747989	-87.939741	0.069888	12.192	308.15	2.29	0.229	V
39469813	45489514	Stack#3	41.747989	-87.939753	1.39776	12.497	310.90	4.69	0.372	V
39469913	45489414	Stack#4	41.747998	-87.939729	0.6552	12.497	310.90	4.69	0.372	V
39470013	45489314	Stack#5	41.748007	-87.939729	0.00056784	10.058	293.00	11.14	0.914	V
39470113	45489214	Stack#6	41.74798	-87.939729	0.62899	12.912	308.15	2.29	0.229	V

Finally, could you provide a property boundary of the facility that includes both buildings? This could be as simple as marking up a map (created using google maps or something similar) and sharing a screenshot.

Not sure how long this will take you to review, but suggests a potential completion date of February 23. If you need additional time, please let me know. Thank you again for your assistance in reviewing the modeling parameters and please don't hesitate to email or call me if you have any questions,

Margaret

Margaret Sieffert | U.S. Environmental Protection Agency R5
Air & Radiation Division | Air Toxics and Assessment Branch
77 W. Jackson Blvd. (AT-18J) | Chicago, IL 60604 | 312.353.1151

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 6/18/2018 4:26:26 PM
To: Nwia, Jacqueline [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d299b56bd7ef46709fb7465fd1e15466-JNwia]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]
Subject: RE: EtO maps for RA briefing
Attachments: Ethylene Oxide Short Term Air Monitoring Results Briefing 06202018.pptx

Found a typo. Here are the maps again.

From: Sieffert, Margaret
Sent: Monday, June 18, 2018 11:25 AM
To: Nwia, Jacqueline <nwia.jacqueline@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Bollweg, George <bollweg.george@epa.gov>
Subject: EtO maps for RA briefing

Jackie and I thought the following 2 maps would be useful for the meeting. Let us know your thoughts.

Message

From: Nam, Ed [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A2653F1DDD59470688BA557DD84D9690-NAM, ED]
Sent: 10/2/2018 7:32:57 PM
To: Breneman, Sara [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=abec1970102a45cfb6b842503a9fae06-SBrenema]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Frank, Nathan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dd8b205f55ab45dea0c01f08e714f8c1-NFrank02]
CC: Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Rountree, Jillian [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7d304e5e55a54908b24b17e57ecdbf3c-JRountre]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
Subject: RE: Request for Inspection

Attorney Client / Ex. 5

From: Breneman, Sara
Sent: Tuesday, October 02, 2018 2:29 PM
To: Nam, Ed <nam.ed@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Frank, Nathan <frank.nathan@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: RE: Request for Inspection

Attorney Client / Ex. 5

From: Nam, Ed
Sent: Tuesday, October 2, 2018 2:28 PM
To: Breneman, Sara <breneman.sara@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Frank, Nathan <frank.nathan@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: RE: Request for Inspection

Attorney Client / Ex. 5

From: Breneman, Sara
Sent: Tuesday, October 02, 2018 2:27 PM
To: Cain, Alexis <cain.alexis@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Frank, Nathan <frank.nathan@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: RE: Request for Inspection

Attorney Client / Ex. 5

From: Cain, Alexis
Sent: Tuesday, October 2, 2018 1:55 PM
To: Nam, Ed <nam.ed@epa.gov>; Breneman, Sara <breneman.sara@epa.gov>; Frank, Nathan <frank.nathan@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: FW: Request for Inspection

Attorney Client / Ex. 5

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Deborah Stone1 (Environment and Sustainability) [mailto:Deborah.Stone@cookcountyil.gov]
Sent: Tuesday, October 02, 2018 12:04 PM
To: Kevin Schnoes1 (Environment and Sustainability) <Kevin.Schnoes@cookcountyil.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Cc: Rountree, Jillian <Rountree.Jillian@epa.gov>
Subject: Request for Inspection

Alexis, Jill and Margaret,
Thank you so much for all your assistance on today's call.
We would like to extend a request to the USEPA Air Inspectional division to conduct a joint inspection of the El`e facility with us.
Please let us know who the appropriate contact(s) would be.
Again, your help is much appreciated.
Deborah Stone
Director
Cook County Department of Environment and Sustainability
312-603-8204

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

MEMORANDUM

DATE: 7/3/2018

SUBJECT: Deviations from Sterigenics QAPP

FROM: Jacqueline Nwia, Project Lead
Air Monitoring and Analysis Section

TO: Bilal Qazzaz, QA Coordinator
Air Monitoring and Analysis Section

This memorandum describes deviations from the Quality Assurance Project Plan for Sterigenics, Willowbrook Illinois Ethylene Oxide Air Monitoring Study, Sterigenics_QAPP_1.0.

1. The QAPP specifies that Bilal Qazzaz, QA Manager, will conduct the data validation review. However, due to reassignment of work, Marta Fuoco, of the Air Monitoring and Analysis Section, conducted the data validation review which was completed on June 14, 2018.

2. Eastern Research Group recalculated the Method Detection Limit (MDL) for ethylene oxide and used the updated value for the Sterigenics ethylene oxide data set. The updated MDL is 0.082 ug/m^3.

3. The QAPP erroneously identified 75% of data completeness for 12-hour composite samples as 16 and grab samples as 12. The correct, 75% of total samples, is as follows:

    a. 12- hour composite samples: 19 total samples*75% = 14
    b. Grab samples: 22*75% = 17

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IBA

CTR
1-24-03

043110AAC
⇒ id file
cc: S Willmanda
- S field
- DESPlane
- Regional Office

February 27, 2003

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Environmental Protection Agency
Bureau of Air
State of Illinois

U.S Environmental Protection Agency-Region V
Air Enforcement and Compliance Assurance Branch
Attn: Compliance Tracker (AE-17J)
77 West Jackson Blvd.
Chicago, IL. 60604-3590

Re: IBA/Griffith Micro Science Administrative Order-Willowbrook I & II Performance Test Results

Dear Ms. Bush:

The following information was inadvertently left out of my letter of February 21, 2003. Element nine (9) of the Administrative Order requested information about any other emission tests that were conducted within three months of the January 23-24, 2003 performance test. IBA did not conduct any other emission test(s) (performance or diagnostic) during the time period of three (3) months prior to the January 23-24, 2003 performance test.

I hope that this letter provides you with sufficient information to show our commitment to meeting each and every element of the Administrative Order. We would be happy to meet with you at any time to further discuss these results. Call me with any questions you might have. You can reach me at 630-928-1724.

Yours truly,

Stephen Dana Morris
Director EH&S

cc: Julie Armitage, Section Manager
Compliance and Systems Management Section
Bureau of Air
Illinois Environmental Protection Agency
1021 North Grand Avenue
Springfield, Illinois 62702

Kathleen Hoffman, Vice-President EH&S
John Gilbert, Vice-President Operations
Mark Bogs, Willowbrook General Manager
Byron F. Taylor, Esq.
Sidley Austin Brown & Wood

IBA-DIVISION OF RECORDS MANAGEMENT
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2015 Spring Road, Suite 650, Oak Brook, IL 60523 ❑ Tel.: (800) 811 4674 ❑ Fax: (630) 928 1701 ❑ Website: http://www.iba-worldwide.com

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Page Two

IBA/Griffith Micro Science
Administrative Order-
Willowbrook I & II Weekly
Aeration Room Test
Results for Fourth Quarter
2003

cc: Julie Armitage, Section Manager
Compliance and Systems Management Section
Bureau of Air
Illinois Environmental Protection Agency
1021 North Grand Avenue
Springfield, Illinois 62702

Kathleen Hoffman, Vice-President EH&S
Don Currie, Vice-President Operations
Jack Fitzpatrick, Willowbrook General Manager
Corey Grauer, Esq.
Byron F. Taylor, Esq.
Sidley Austin Brown & Wood

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JAN 26 2004
Environmental Protection Agency
Bureau of Air
STATE OF ILLINOIS

IBA

January 22, 2004

U.S Environmental Protection Agency-Region 5
Air Enforcement and Compliance Assurance Branch
Attn: Compliance Tracker (AE-17J)
77 West Jackson Blvd.
Chicago, IL. 60604-3590

Re: IBA/Griffith Micro Science Administrative Order-Willowbrook I & II Weekly Aeration Room Test Results for Fourth Quarter 2003

Dear Ms. Bush:

IBA is hereby submitting the weekly ethylene oxide emission results of the sampling of the inlet and outlet duct for the AAT Dry Beds for both Willowbrook I & II. This information is being submitted as required by section 40 of the Administrative Order issued on December 24, 2002. The weekly ethylene oxide emission data is presented in Tables One through Three. Additionally, per section 11 of Attachment A of the Order, we have included chromatograms for the Perkin Elmer and Baseline Gas Chromatographs. They are Attachment A and B respectively.

Since, we did not exceed the Tier I Ethylene Oxide usage for either Willowbrook I or II we did not send any bag samples out for analysis as required by section 5.1 or 5.2 of the Tiered Monitoring Plans.

Also, neither of the AAT Dry Beds for the Willowbrook facilities was replaced during the quarter.

Lastly, this is the last quarterly report required by section 10 of Attachment A of the Administrative Order. However, the Willowbrook facilities will continue to monitor the dry bed emissions as agreed to in the Monitoring Plans.

Call me with any questions you might have with regard to this quarterly monitoring report or the attachments. You can reach me at 630-928-1724.

Yours truly,

Stephen Dana Morris
Director EH&S

Enclosures: Tables one-three
Attachment A-B

2015 Spring Road, Suite 650, Oak Brook, IL 60523 ❑ Tel.: (800) 811 4674 ❑ Fax: (630) 928-1701 ❑ Website: http://www.iba-worldwide.com

TABLE ONE
WILLOWBROOK I AAT DRY BED-AERATION TESTING FOR FOURTH QUARTER 2003

Sample Date	Perkin Elmer	WB1 Aeration Exhaust	Outlet Concentration must be < 1 ppm	Baseline	WB1 Aeration Exhaust	Outlet Concentration must be < 1 ppm
		Dry Bed Inlet	*Dry Bed Outlet*		*Dry Bed Inlet*	*Dry Bed Outlet*
		EtO Concentration (ppm)	*EtO Concentration (ppm)*		*EtO Concentration (ppm)*	*EtO Concentration (ppm)*
10/03/2003		9.79	0.25		9.22	0.0563
10/09/2003		12.79	0.41		12.80	0.315
10/15/2003		7.84	0.58		8.73	0.361
10/22/2003		12.96	0.30		11.40	0.369
10/28/2003		6.54	0.24		6.86	0.185
11/06/2003		9.19	0.30		7.57	0.275
11/12/2003		16.90	0.30		12.10	0.322
11/20/2003		9.55	0.14		9.14	BMDL*
11/24/2003		7.90	0.36		8.05	0.276
12/05/2003		16.03	0.71		14.60	0.36
12/10/2003		15.59	0.69		14.60	0.594
12/18/2003		13.02	0.56		13.00	0.387
12/23/2003		16.92	1.20		17.10	0.437
12/31/2003		8.75	0.56		7.05	0.249

KEY:
*BMDL=Below Minimum Detection Level

ED_002192_00004533-00004

TABLE TWO
WILLOWBROOK II AAT DRY BED AERATION TESTING
FOR FOURTH QUARTER 2003

Date	Perkin Elmer	WB2 Aeration Exhaust	Outlet Concentration must be < 1 ppm	Baseline	WB2 Aeration Exhaust	Outlet Concentration must be < 1 ppm
		Dry Bed Inlet	*Dry Bed Outlet*		*Dry Bed Inlet*	*Dry Bed Outlet*
		EtO Concentration (ppm)	*EtO Concentration (ppm)*		*EtO Concentration (ppm)*	*EtO Concentration (ppm)*
10/03/2003		15.51	0.0		12.5	0.239
10/09/2003		2.65	0.0		2.57	BMDL*
10/15/2003		1.72	0.0		1.52	0.116
10/22/2003		2.03	0.0		1.45	0.196
10/28/2003		2.64	0.12		2.37	0.187
11/06/2003		3.54	0.49		2.67	0.589
11/12/2003		4.48	0.0		3.43	0.232
11/20/2003		2.89	0.0		2.48	0.113
11/24/2003		3.03	0.22		3.14	BMDL*
12/05/2003		2.32	0.0		1.69	0.428
12/10/2003		4.73	0.11		4.85	0.433
12/18/2003		2.75	0.13		2.50	0.088
12/23/2003		13.48	0.48		12.60	0.158
12/31/2003		2.67	0.0		1.91	0.210

* Key: BMDL=Below Minimum Detection Level

ED_002192_00004533-00005

TABLE THREE
WILLOWBROOK II AAT DRY BED CHAMBER TESTING
FOR FOURTH QUARTER 2003

Date	Perkin Elmer	WB2 Chamber Exhaust	Outlet Concentration must be < 60 ppm	Baseline	WB2 Chamber Exhaust	Outlet Concentration must be < 60 ppm
		Dry Bed Inlet	*Dry Bed Outlet*		*Dry Bed Inlet*	*Dry Bed Outlet*
		EtO Concentration (ppm)	*EtO Concentration (ppm)*		*EtO Concentration (ppm)*	*EtO Concentration (ppm)*
10/03/2003		58.95	0.28		12.4	BMDL*
10/09/2003		67.42	0.22		38.0	0.053
10/15/2003		99.34	0.14		48.4	0.244
10/22/2003		111.30	0.23		41.7	0.363
10/28/2003		124.16	0.47		56.4	0.438
11/06/2003		111.50	0.75		40.3	0.773
11/12/2003		107.42	0.62		40.4	0.598
11/20/2003		107.15	1.04		50.3	1.05
11/24/2003		132.57	1.37		46.9	1.15
12/05/2003		208.96	3.69		61.0	1.81
12/10/2003		187.61	2.51		61.8	2.22
12/18/2003		31.76	0.56		28.6	0.716
12/23/2003		192.35	4.30		64.5	2.76
12/31/2003		181.76	2.73		52.0	2.02

* Key: BMDL=Below Minimum Detection Level

ED_002192_00004533-00006

ATTACHMENT A

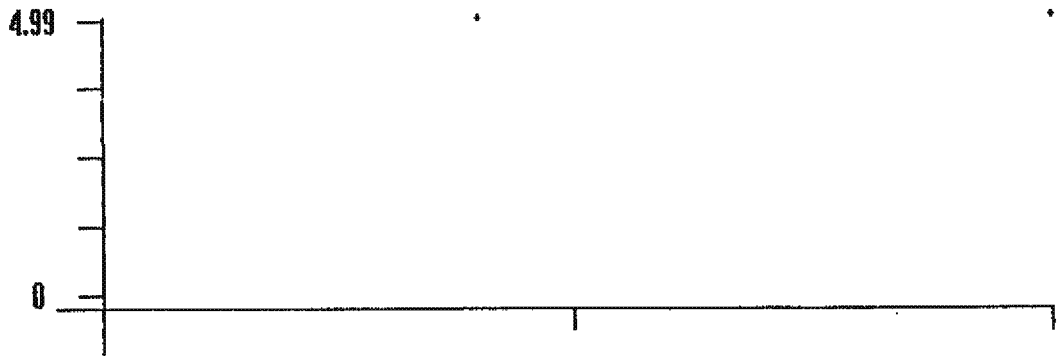
WILLOWBROOK I & II
Fourth QUARTER
(October to December 2003)

AERATION ROOM & CHAMBER DISCHARGE TESTING
PERKIN ELMER RESULTS

Monitor Single Port

5.1 PPM

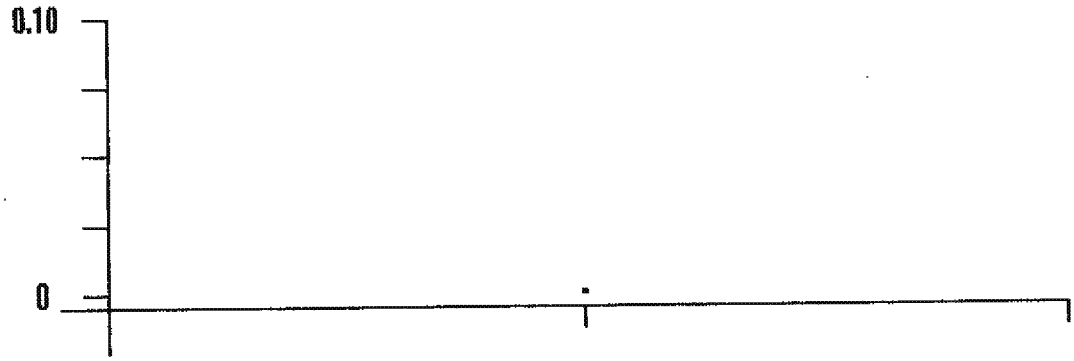
Port: Diagnostic
Component: ETO
Start Time: Oct 3,2003 08:05
End Time: Oct 3,2003 08:10
Number of points: 3
Average Value: 4.99



Oct/03/2003 08:05	4.99
Oct/03/2003 08:07	4.99
Oct/03/2003 08:10	4.99

WBII outlet

Port: Diagnostic
Component: ETO
Start Time: Oct 3,2003 08:40
End Time: Oct 3,2003 08:40
Number of points: 1
Average Value: 0.00

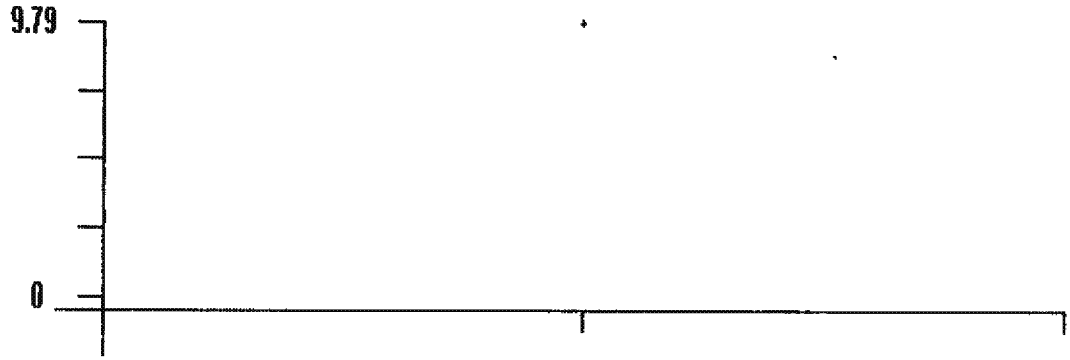


Oct/03/2003 08:40 .00

WBF inlet

Monitor Single Port

Port: Diagnostic
Component: ETO
Start Time: Oct 3,2003 08:35
End Time: Oct 3,2003 08:35
Number of points: 1
Average Value: 9.79

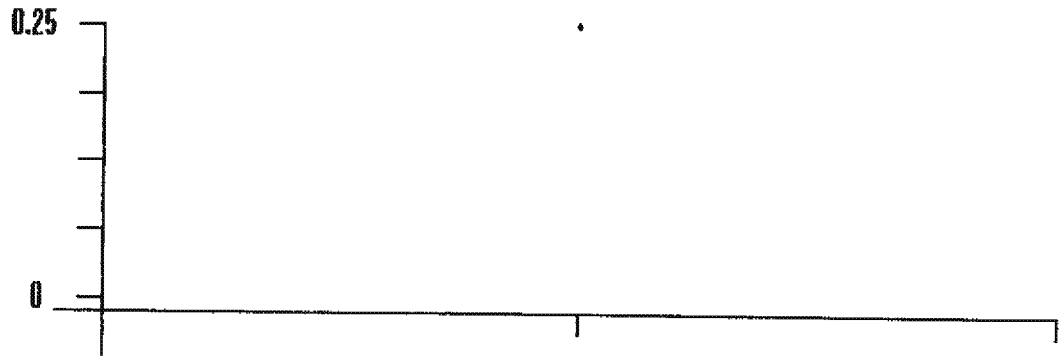


Oct/03/2003 08:35 9.79

WBI outlet

Monitor Single Port

Port: Diagnostic
Component: ETO
Start Time: Oct 3,2003 08:30
End Time: Oct 3,2003 08:30
Number of points: 1
Average Value: 0.25

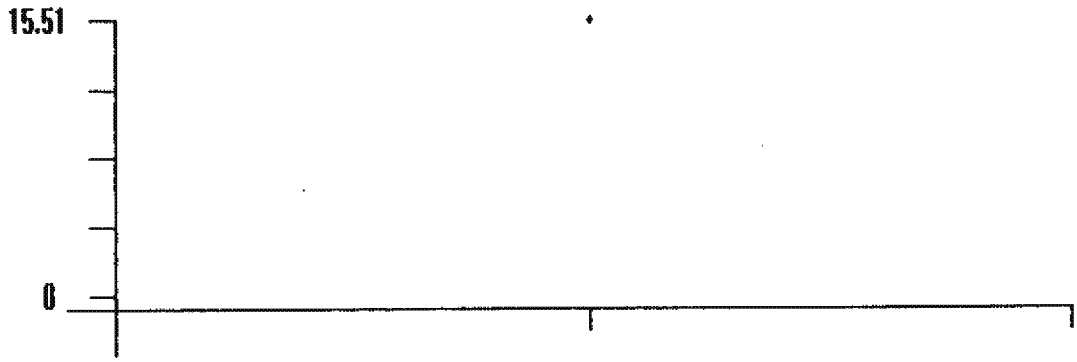


Oct/03/2003 08:30 .25

WBII ~~outlet~~ inlet for 10-3-03

Monitor Single Port

Port: Diagnostic
Component: ETO
Start Time: Oct 3,2003 09:03
End Time: Oct 3,2003 09:03
Number of points: 1
Average Value: 15.51

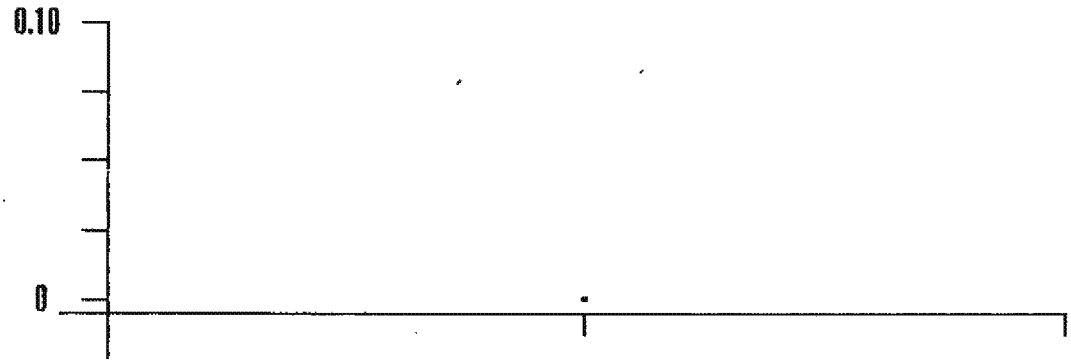


Oct/03/2003 09:03 15.51

WBII outlet

Monitor Single Port

Port: Diagnostic
Component: ETO
Start Time: Oct 3,2003 08:40
End Time: Oct 3,2003 08:40
Number of points: 1
Average Value: 0.00

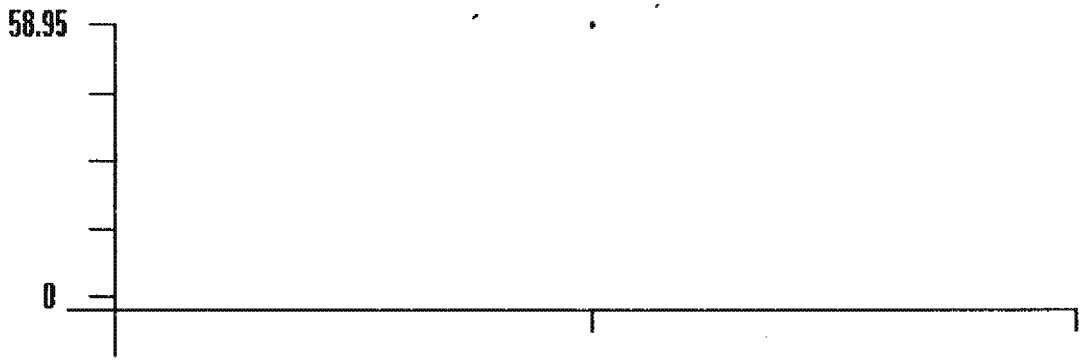


Oct/03/2003 08:40 .00

1/B II inlet A.F

Monitor Single Port

Port: Diagnostic
Component: ETO
Start Time: Oct 3,2003 08:58
End Time: Oct 3,2003 08:58
Number of points: 1
Average Value: 58.95

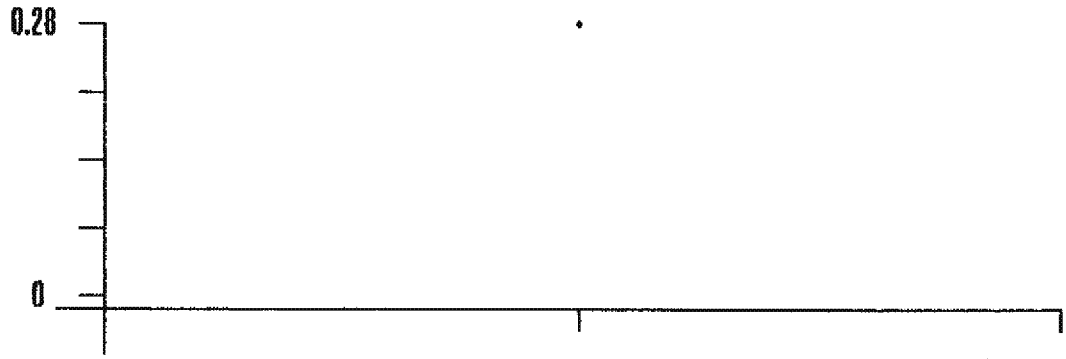


Oct/03/2003 08:58 58.95

UBII outlet A.I

Monitor Single Port

Port: Diagnostic
Component: ETO
Start Time: Oct 3,2003 08:52
End Time: Oct 3,2003 08:52
Number of points: 1
Average Value: 0.28

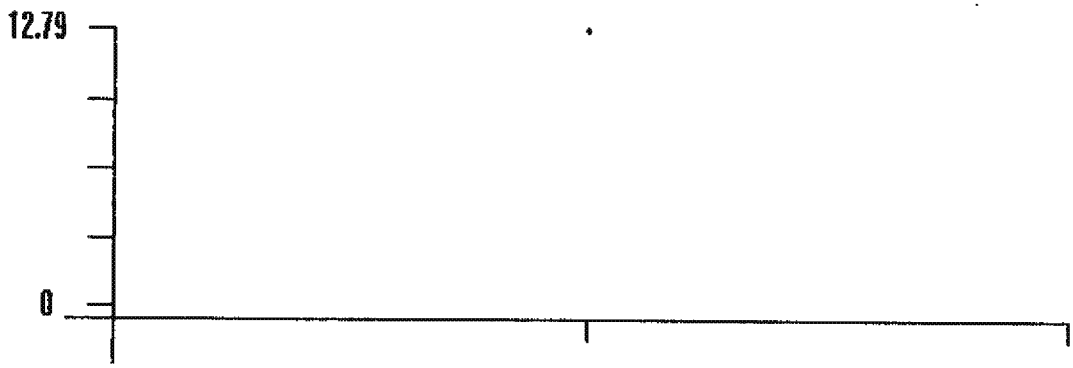


Oct/03/2003 08:52 .28

Monitor Single Port

NBI IN

Port: Diagnostic
Component: ETO
Start Time: Oct 10,2003 18:45
End Time: Oct 10,2003 18:45
Number of points: 1
Average Value: 12.79

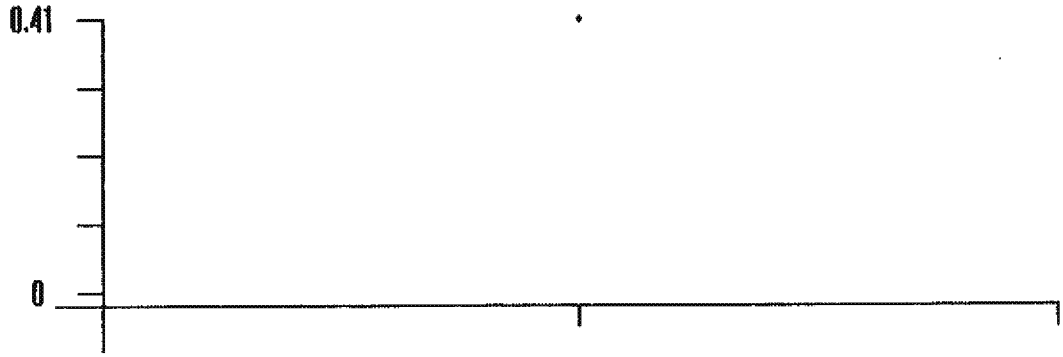


Oct/10/2003 18:45 12.79

Monitor Single Port

INB I OUT

Port: Diagnostic
Component: ETO
Start Time: Oct 10,2003 18:33
End Time: Oct 10,2003 18:33
Number of points: 1
Average Value: 0.41

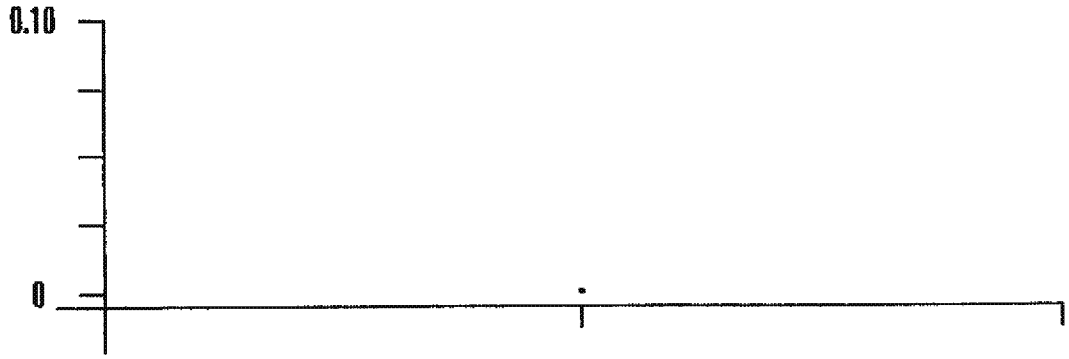


Oct/10/2003 18:33 .41

Monitor Single Port

WO II out

Port: Diagnostic
Component: ETO
Start Time: Oct 10,2003 18:21
End Time: Oct 10,2003 18:21
Number of points: 1
Average Value: 0.00

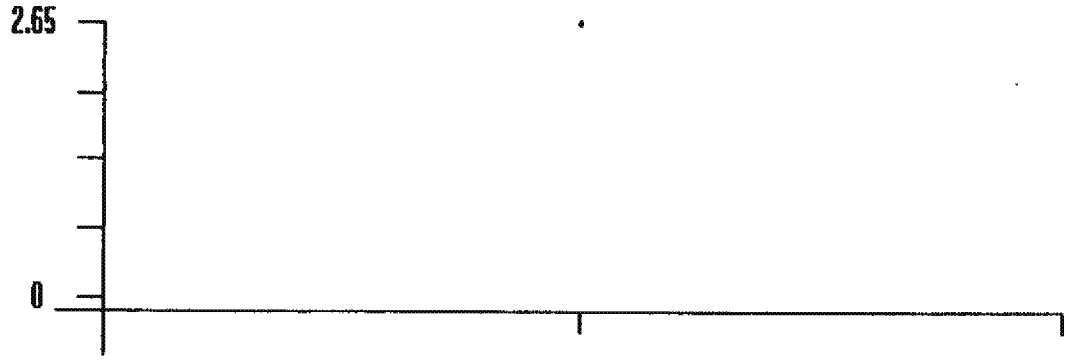


Oct/10/2003 18:21 .00

Monitor Single Port

WB II IN

Port: Diagnostic
Component: ETO
Start Time: Oct 10,2003 18:39
End Time: Oct 10,2003 18:39
Number of points: 1
Average Value: 2.65

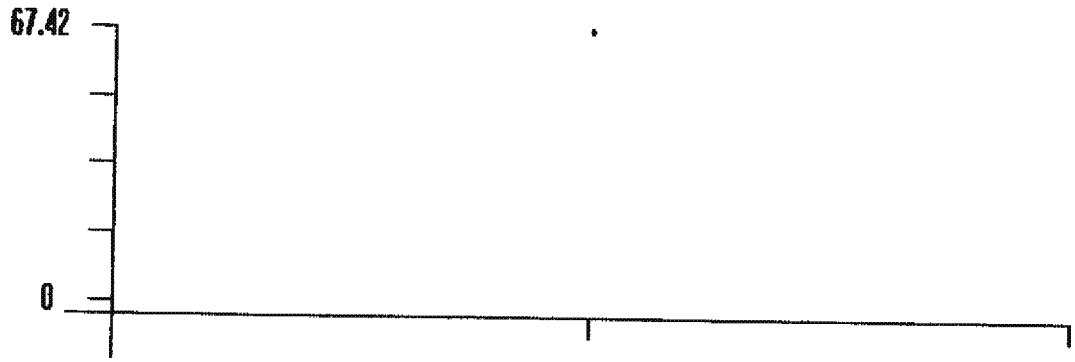


Oct/10/2003 18:39 2.65

Monitor Single Port

JA II AV IN

Port: Diagnostic
Component: ETO
Start Time: Oct 10,2003 18:51
End Time: Oct 10,2003 18:51
Number of points: 1
Average Value: 67.42

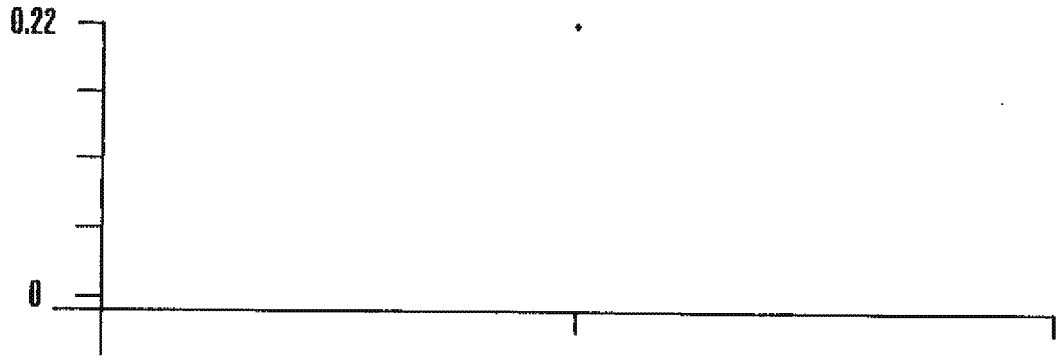


Oct/10/2003 18:51 67.42

Monitor Single Port

Port: Diagnostic
Component: ETO
Start Time: Oct 10,2003 18:27
End Time: Oct 10,2003 18:27
Number of points: 1
Average Value: 0.22

WB II AV OUT

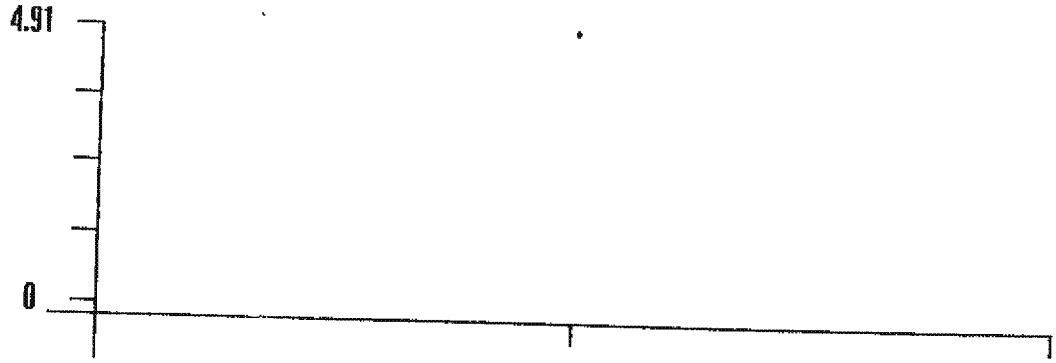


Oct/10/2003 18:27 .22

Monitor Single Port

Calibration

Port: Diagnostic
Component: ETO
Start Time: Oct 10,2003 18:14
End Time: Oct 10,2003 18:14
Number of points: 1
Average Value: 4.91

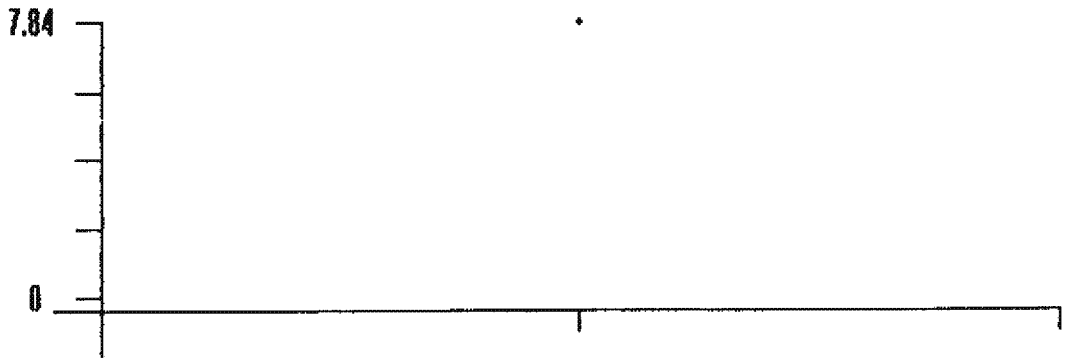


Oct/10/2003 18:14 4.91

Monitor Single Port

WBI inlet

Port: Diagnostic
Component: ETO
Start Time: Oct 15,2003 11:18
End Time: Oct 15,2003 11:18
Number of points: 1
Average Value: 7.84

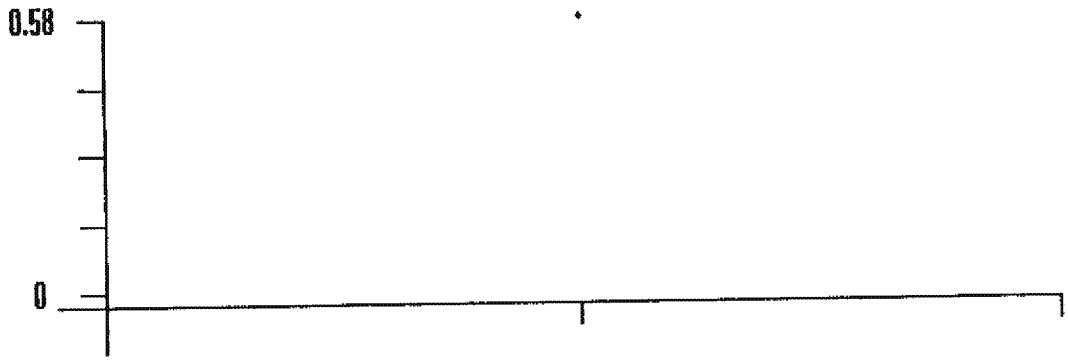


Oct/15/2003 11:18 7.84

Monitor Single Port

WBI outlet

Port: Diagnostic
Component: ETO
Start Time: Oct 15,2003 11:13
End Time: Oct 15,2003 11:13
Number of points: 1
Average Value: 0.58

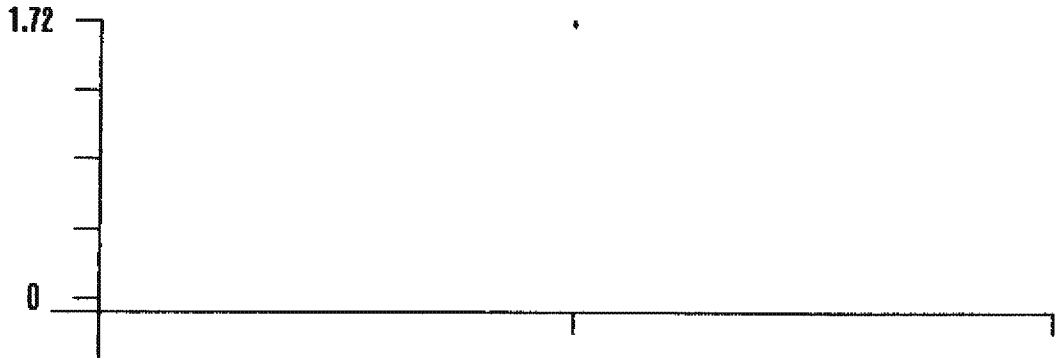


Oct/15/2003 11:13 .58

WBII Inlet

Monitor Single Port

Port: Diagnostic
Component: ETO
Start Time: Oct 15,2003 11:27
End Time: Oct 15,2003 11:27
Number of points: 1
Average Value: 1.72

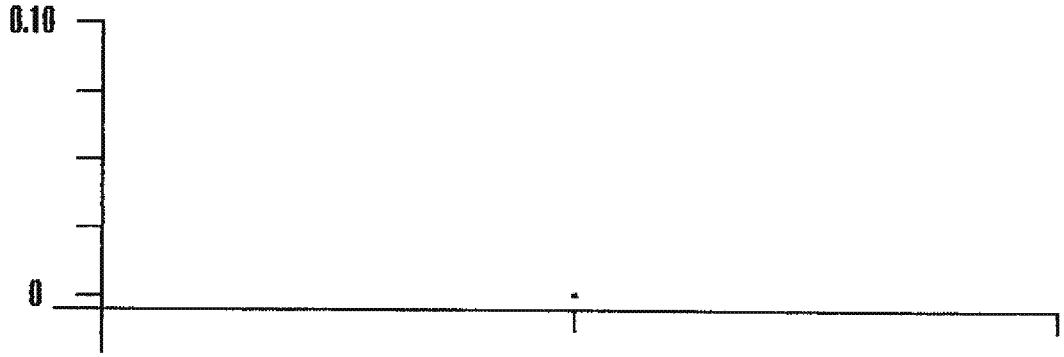


Oct/15/2003 11:27 1.72

Monitor Single Port

WBII outlet

Port: Diagnostic
Component: ETO
Start Time: Oct 15,2003 11:23
End Time: Oct 15,2003 11:23
lumber of points: 1
Average Value: 0.00

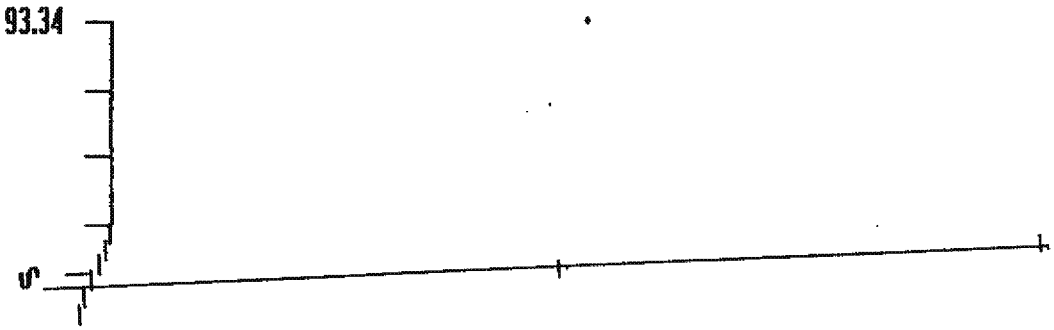


ct/15/2003 11:23 .00

Monitor Single Port

VB II inlet A.F.

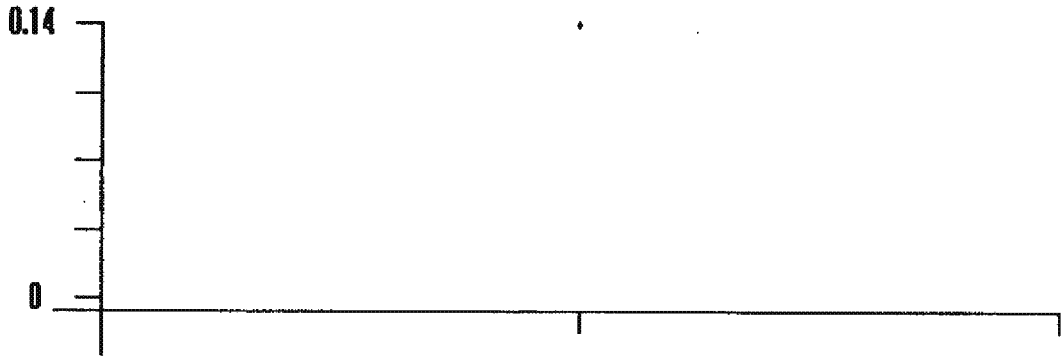
Port: Diagnostic
Component: ETO
Start Time: Oct 15,2003 11:37
End Time: Oct 15,2003 11:37
Number of points: 1
Average Value: 93.34



10/15/2003 11:37 93.34

WB H outlet 01'1,

Port: Diagnostic
Component: ETO
Start Time: Oct 15,2003 11:32
End Time: Oct 15,2003 11:32
Number of points: 1
Average Value: 0.14

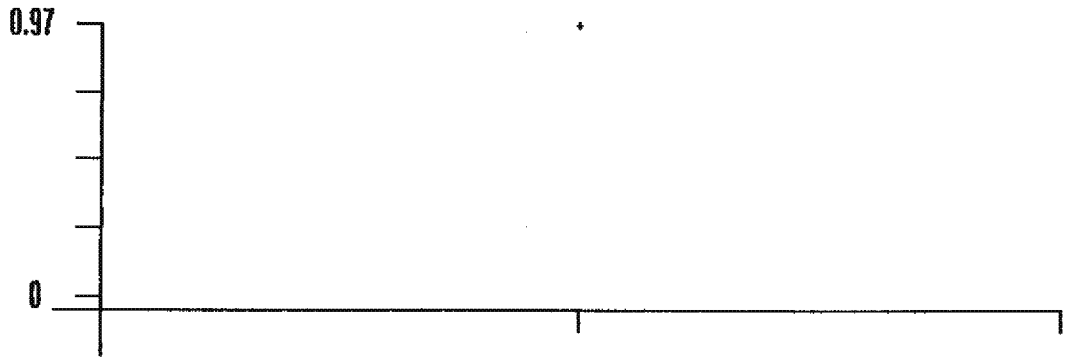


Oct/15/2003 11:32 .14

Monitor Single Port

1.1 PPM

Port: Diagnostic
Component: ETO
Start Time: Oct 15,2003 11:08
End Time: Oct 15,2003 11:08
Number of points: 1
Average Value: 0.97

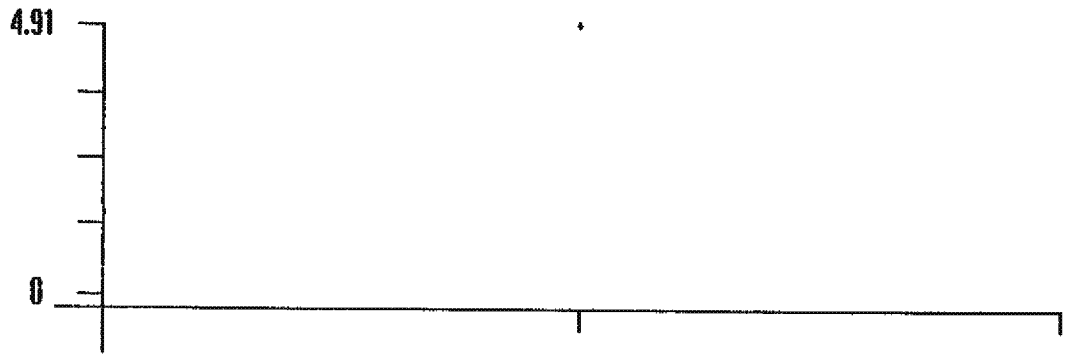


Oct/15/2003 11:08 .97

501 PPM

Monitor Single Port

Port: Diagnostic
Component: ETO
Start Time: Oct 15,2003 11:03
End Time: Oct 15,2003 11:03
Number of points: 1
Average Value: 4.91

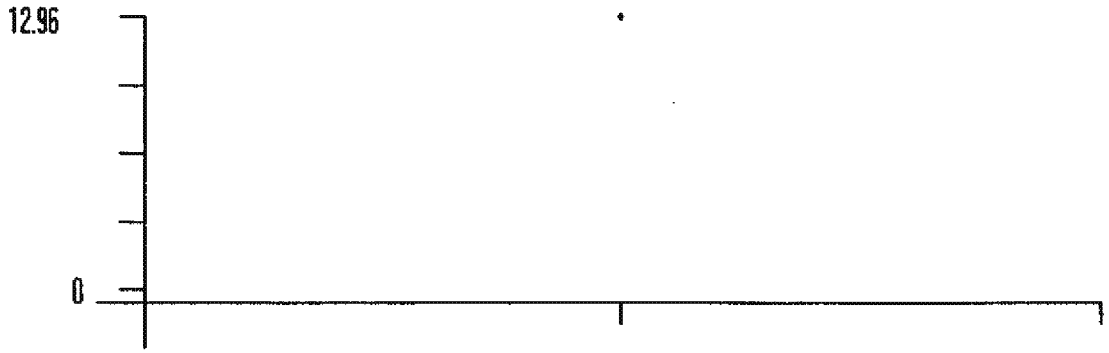


Oct/15/2003 11:03 4.91

WBI inlet

Monitor Single Port

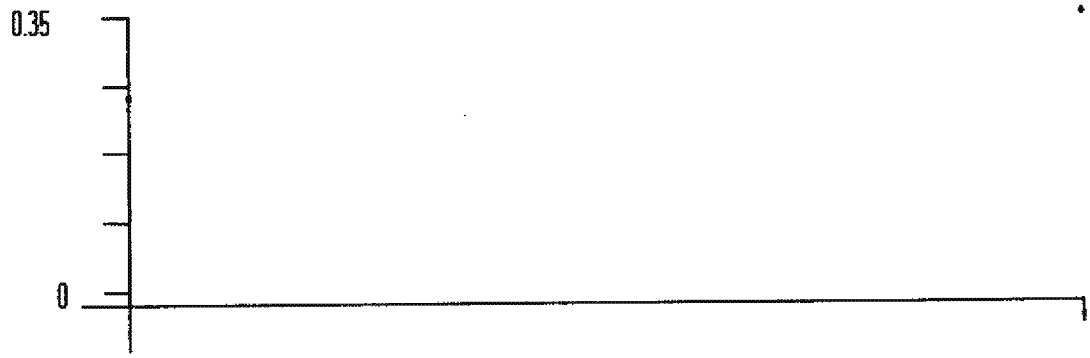
Port	Diagnostic
Component	ETO
Start Time:	Oct 22,2003 14:00
End Time:	Oct 22,2003 14:00
Number of points:	1
Average Value:	12.96



WBI outlet

Monitor Single Port

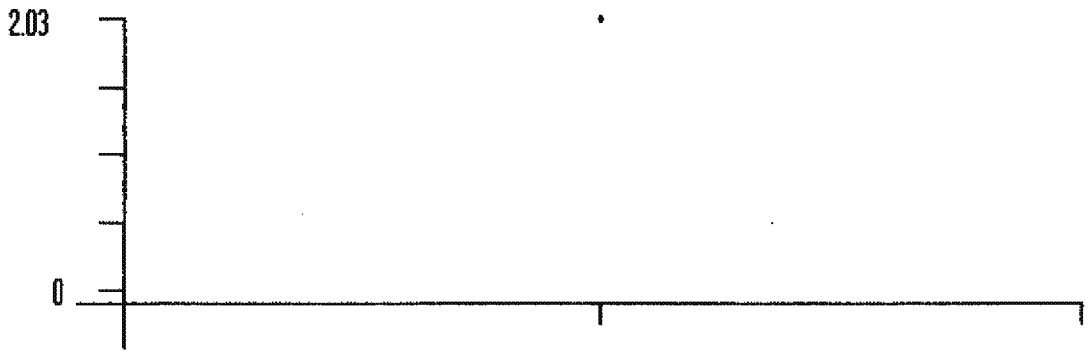
Port:	Diagnostic
Component:	ETO
Start Time:	Oct 22,2003 13:54
End Time:	Oct 22,2003 13:56
Number of points:	2
Average Value:	0.30



UBII inlet

Monitor Single Port

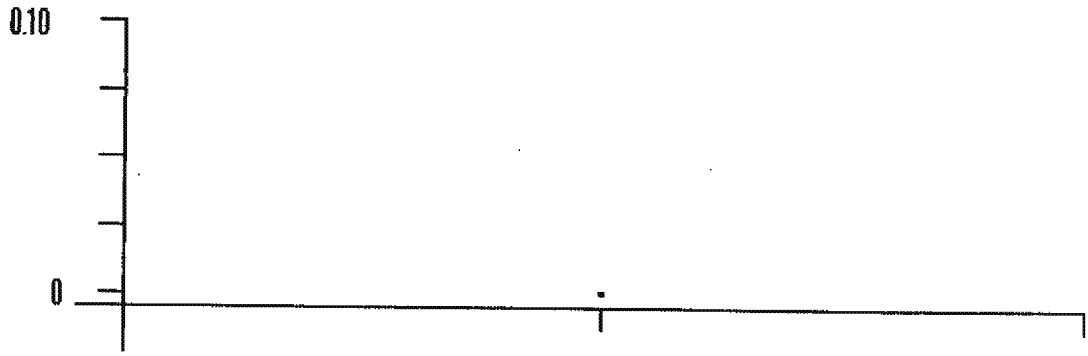
Port:	Diagnostic
Component:	ETO
Start Time:	Oct 22,2003 14:10
End Time:	Oct 22,2003 14:10
Number of points:	1
Average Value:	2.03



WB II outlet

Monitor Single Port

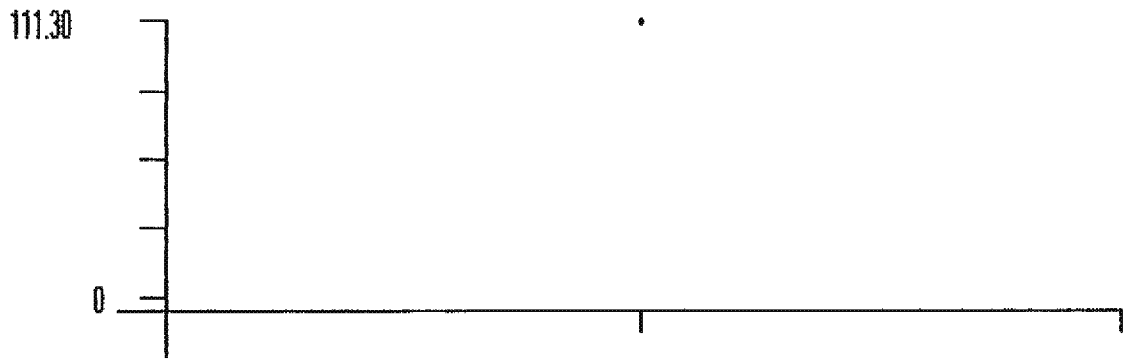
Port:	Diagnostic
Component:	ETO
Start Time:	Oct 22,2003 14:05
End Time:	Oct 22,2003 14:05
Number of points:	1
Average Value:	0.00



WB II inlet AF

Monitor Single Port

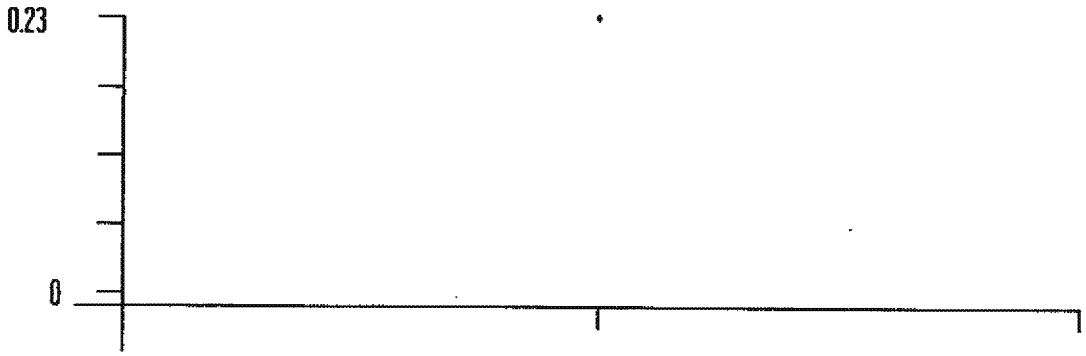
Port	Diagnostic
Component	ETO
Start Time:	Oct 22,2003 14:36
End Time:	Oct 22,2003 14:36
Number of points:	1
Average Value:	111.30



WB II outlet A.F.

Monitor Single Port

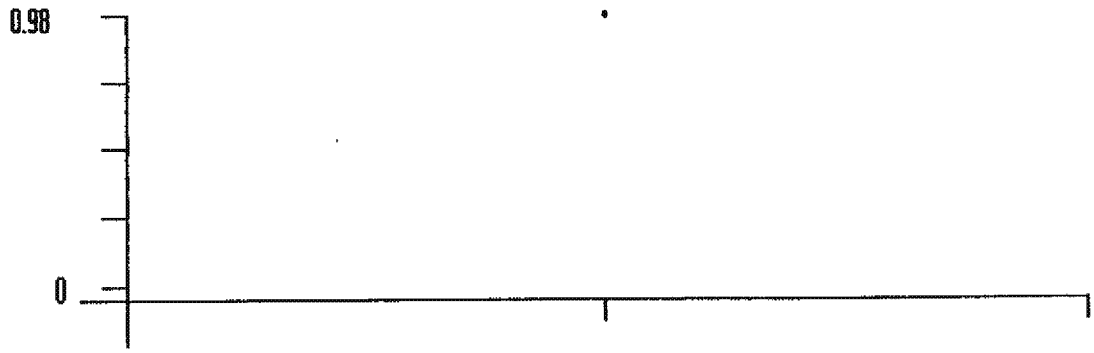
Port:	Diagnostic
Component:	ETO
Start Time:	Oct 22,2003 14:14
End Time:	Oct 22,2003 14:14
Number of points:	1
Average Value:	0.23



1.1 PPM

Monitor Single Port

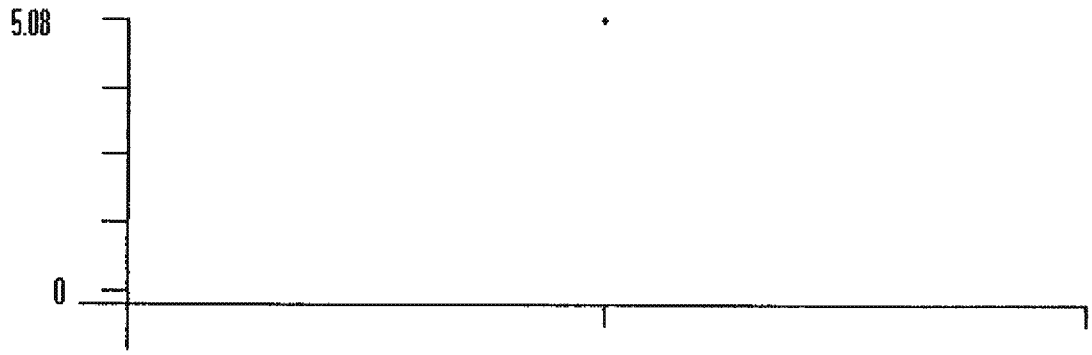
Port	Diagnostic
Component	ETO
Start Time:	Oct 22,2003 13:49
End Time:	Oct 22,2003 13:49
Number of points:	1
Average Value:	0.98



5.1 PPM

Monitor Single Port

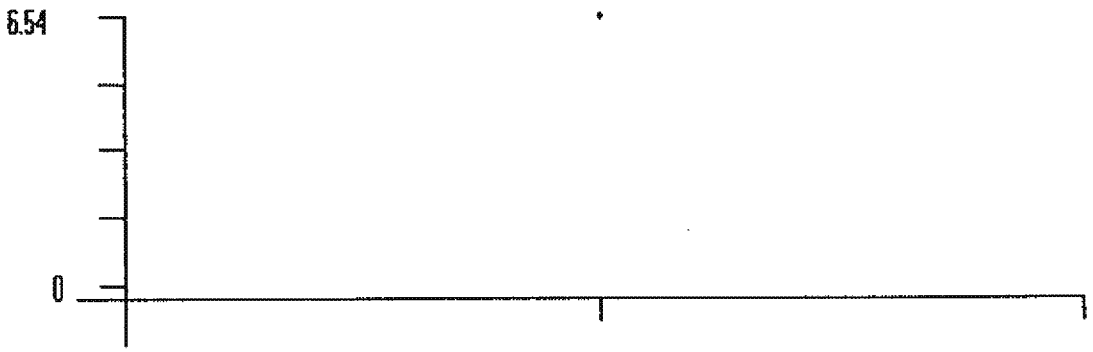
Port:	Diagnostic
Component:	ETO
Start Time:	Oct 22,2003 13:44
End Time:	Oct 22,2003 13:44
Number of points:	1
Average Value:	5.08



WBI inlet

Monitor Single Port

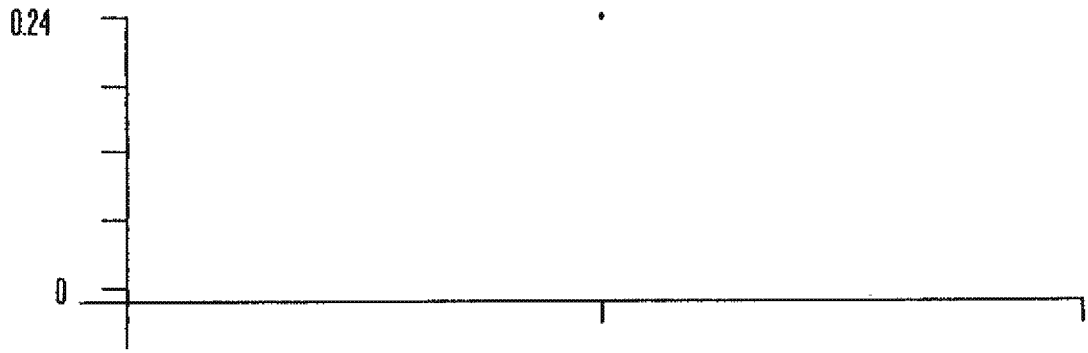
Port	Diagnostic
Component	ETO
Start Time:	Oct 28,2003 10:33
End Time:	Oct 28,2003 10:33
Number of points:	1
Average Value:	6.54



WBI outlet

Monitor Single Port

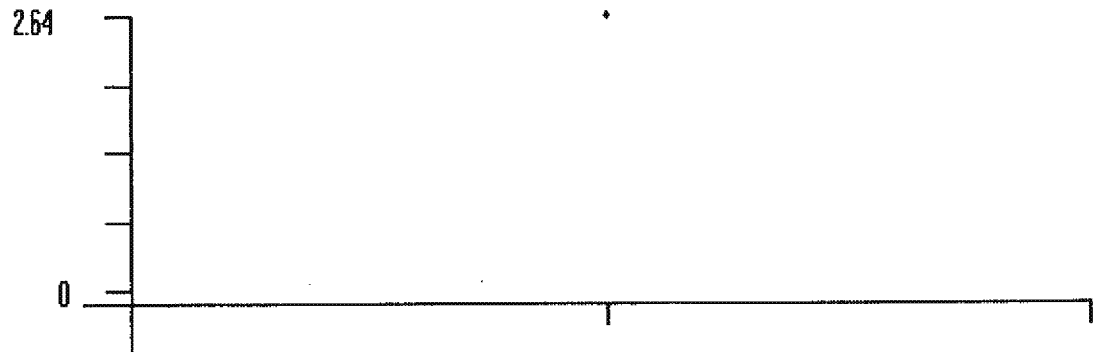
Port	Diagnostic
Component	ETO
Start Time:	Oct 28,2003 10:28
End Time:	Oct 28,2003 10:28
Number of points:	1
Average Value:	0.24



WB II inlet

Monitor Single Port

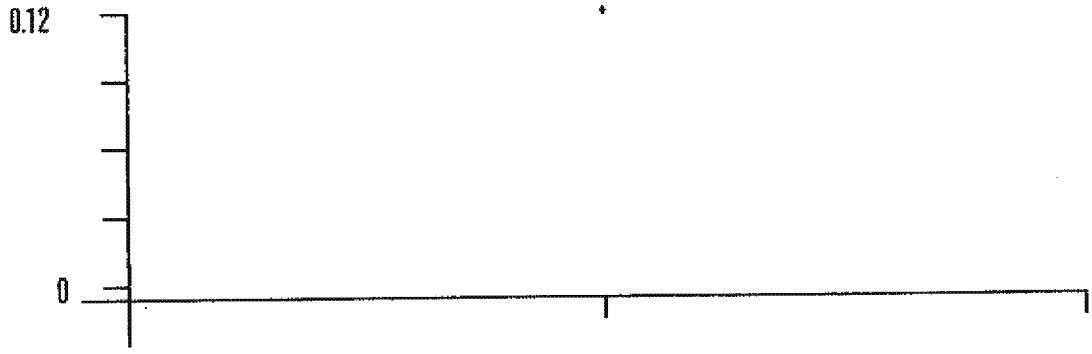
Port	Diagnostic
Component	ETO
Start Time:	Oct 28 2003 10:39
End Time:	Oct 28,2003 10:39
Number of points:	1
Average Value:	2.64



WBII outlet

Monitor Single Port

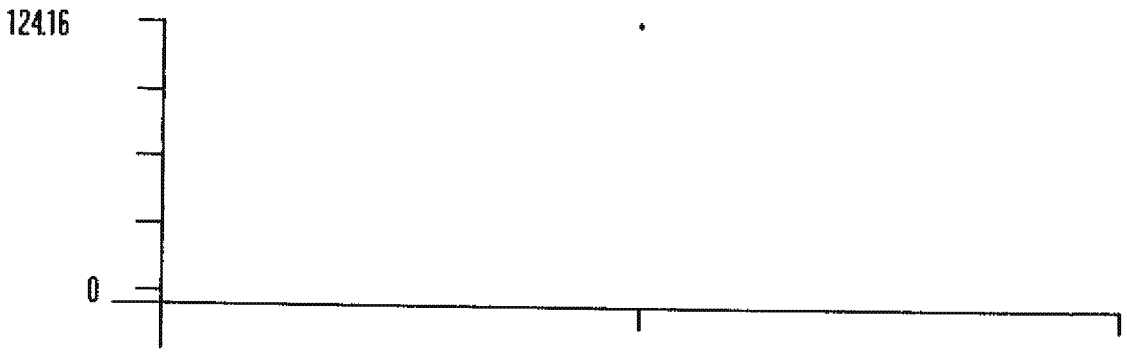
Port:	Diagnostic
Component:	ETO
Start Time:	Oct 28,2003 10:44
End Time:	Oct 28,2003 10:44
Number of points:	1
Average Value:	0.12



WBII inlet
A.F

Monitor Single Port

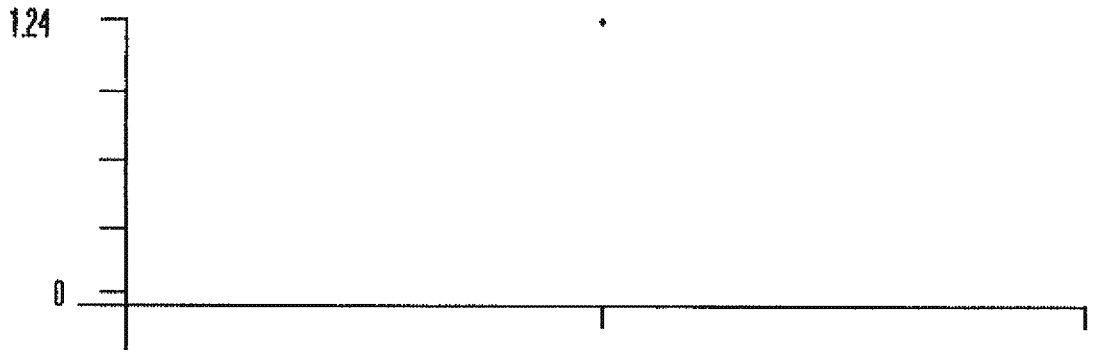
Port	Diagnostic
Component	ETO
Start Time:	Oct 28,2003 10:54
End Time:	Oct 28,2003 10:54
Number of points:	1
Average Value:	124.16



1.1 ppm

Monitor Single Port

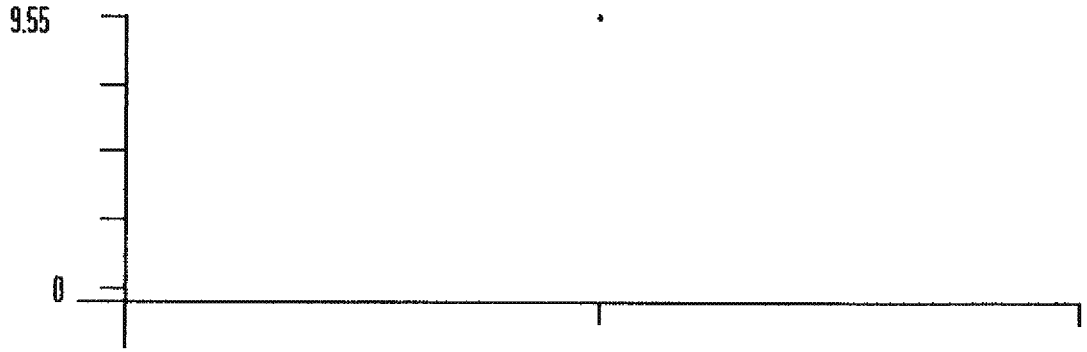
Port:	Diagnostic
Component:	ETO
Start Time:	Nov 12,2003 11:02
End Time:	Nov 12,2003 11:02
Number of points:	1
Average Value:	1.24



UBI Inlet

Monitor Single Port

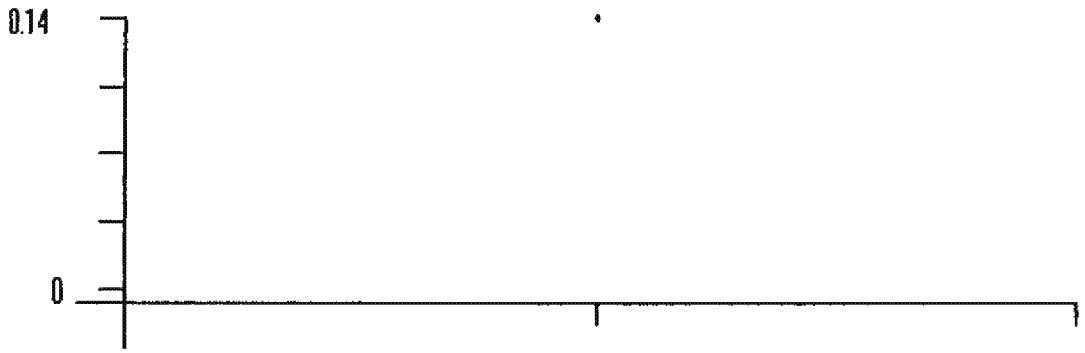
Port:	Diagnostic
Component:	ETO
Start Time:	Nov 20,2003 10:35
End Time:	Nov 20,2003 10:35
Number of points:	1
Average Value:	9.55



UBF outlet

Monitor Single Port

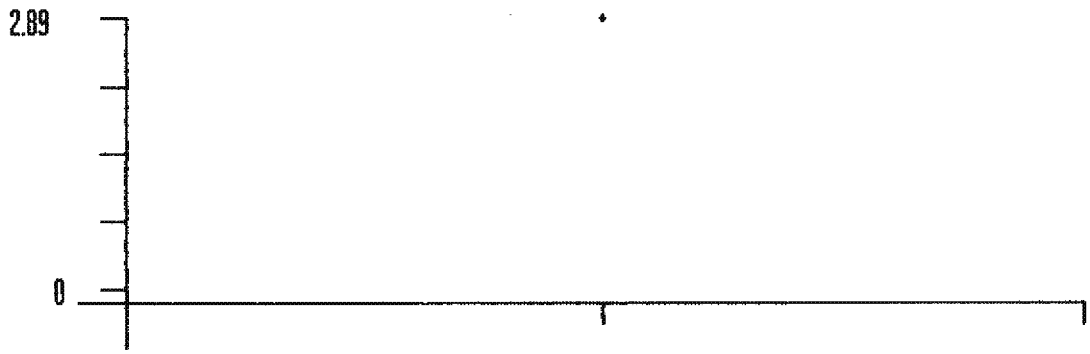
Port:	Diagnostic
Component:	ETO
Start Time:	Nov 20,2003 10:30
End Time:	Nov 20,2003 10:30
Number of points:	1
Average Value:	0.14



WB II inlet

Monitor Single Port

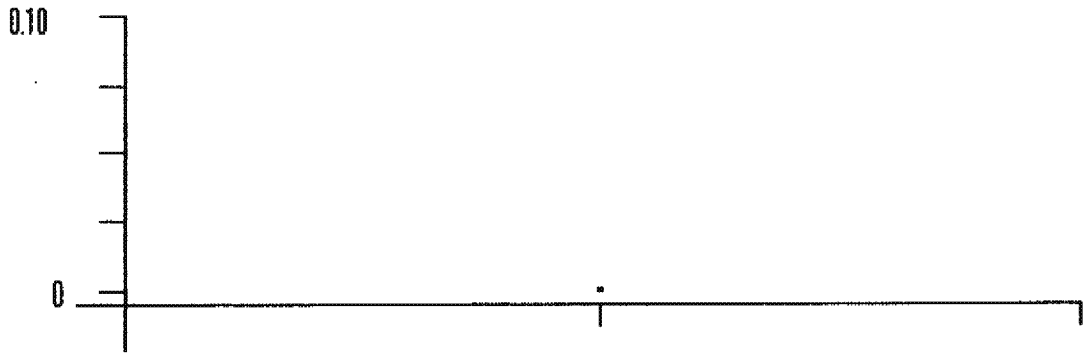
Port	Diagnostic
Component	ETO
Start Time:	Nov 20,2003 10:44
End Time:	Nov 20,2003 10:44
Number of points:	1
Average Value:	2.89



wBII outlet

Monitor Single Port

Port	Diagnostic
Component	ETO
Start Time:	Nov 20,2003 10:40
End Time:	Nov 20,2003 10:40
Number of points:	1
Average Value:	0.00

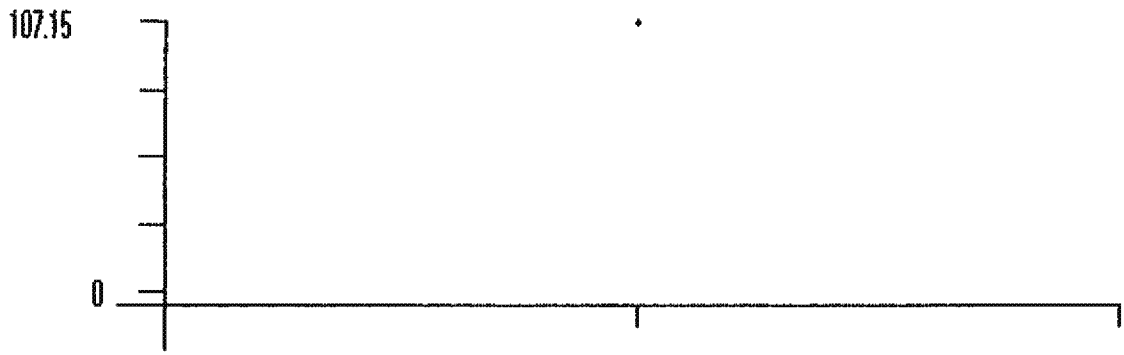


WBII inlet

A.F.

Monitor Single Port

Port	Diagnostic
Component	ETO
Start Time:	Nov 20,2003 10:54
End Time:	Nov 20,2003 10:54
Number of points:	1
Average Value:	107.15

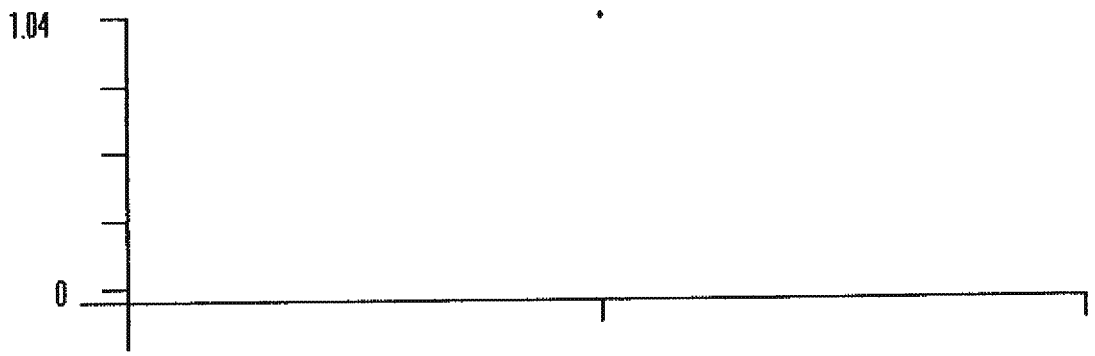


LUBII outlet

A.F.

Monitor Single Port

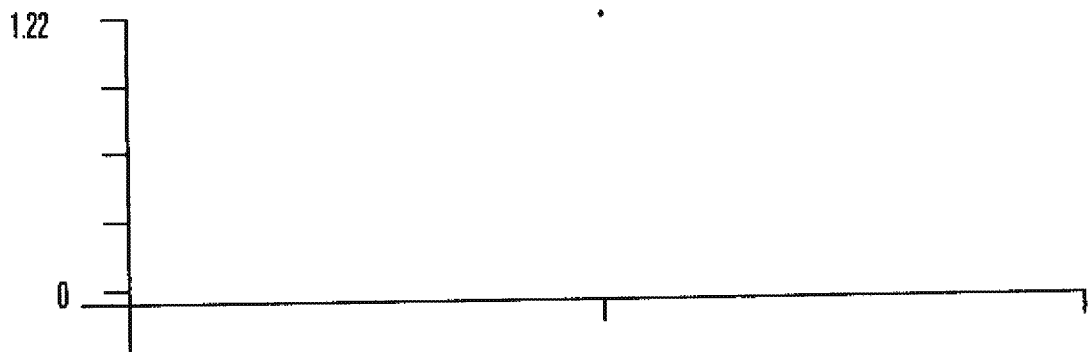
Port:	Diagnostic
Component:	ETO
Start Time:	Nov 20,2003 10:49
End Time:	Nov 20,2003 10:49
Number of points:	1
Average Value:	1.04



1,18PM

Monitor Single Port

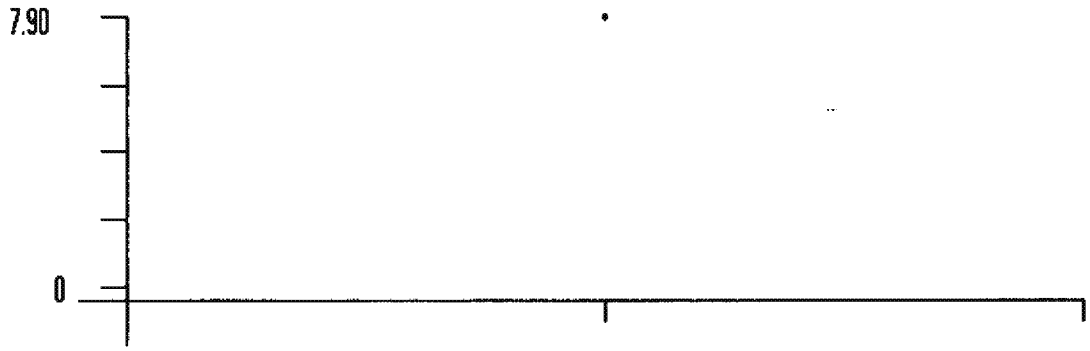
Port:	Diagnostic
Component:	ETO
Start Time:	Nov 20,2003 10:25
End Time:	Nov 20,2003 10:25
Number of points:	1
Average Value:	1.22



UBI inlet

Monitor Single Port

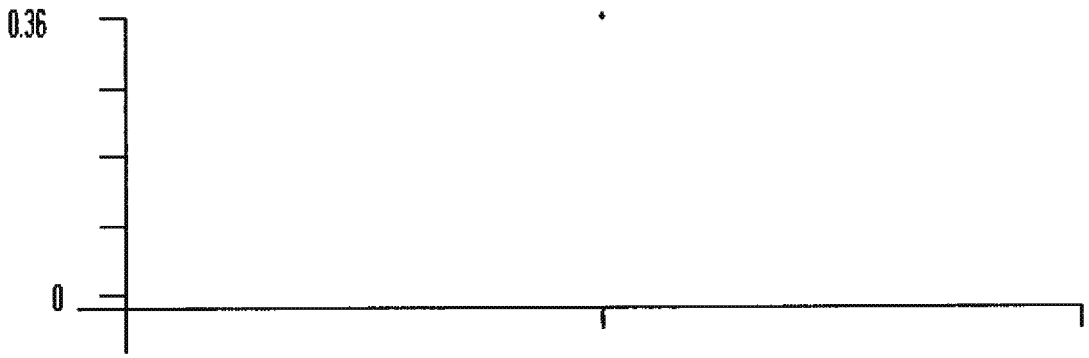
Port	Diagnostic
Component	ETO
Start Time:	Nov 24,2003 10:36
End Time:	Nov 24,2003 10:36
Number of points:	1
Average Value:	7.90



VBI outlet

Monitor Single Port

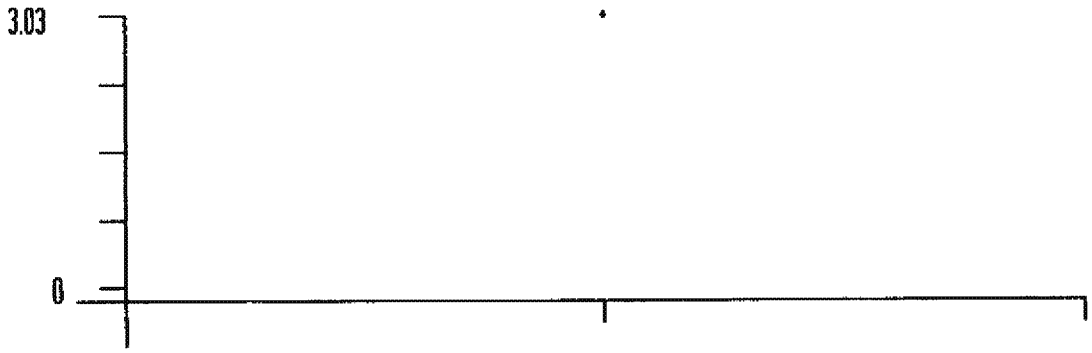
Port:	Diagnostic
Component:	ETO
Start Time:	Nov 24,2003 10:31
End Time:	Nov 24,2003 10:31
Number of points:	1
Average Value:	0.36



WB II inlet
~~outlet~~
~~outlet~~

Monitor Single Port

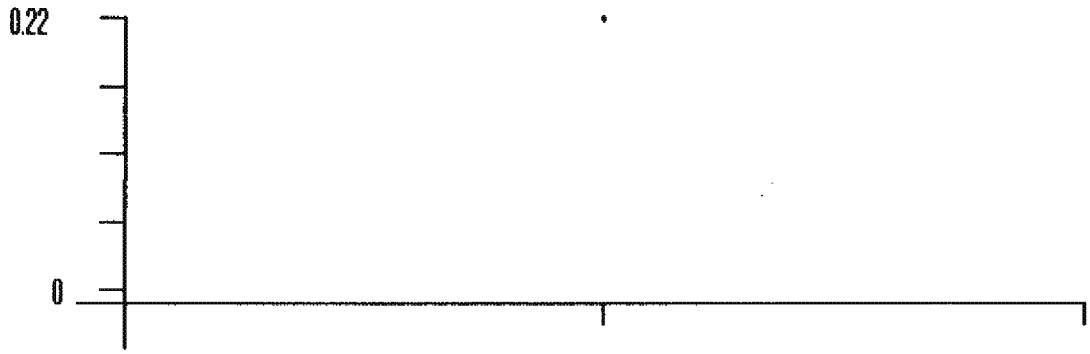
Port	Diagnostic
Component	ETO
Start Time:	Nov 24,2003 10:41
End Time:	Nov 24,2003 10:41
Number of points:	1
Average Value:	3.03



WB II ~~inlet~~ outlet

Monitor Single Port

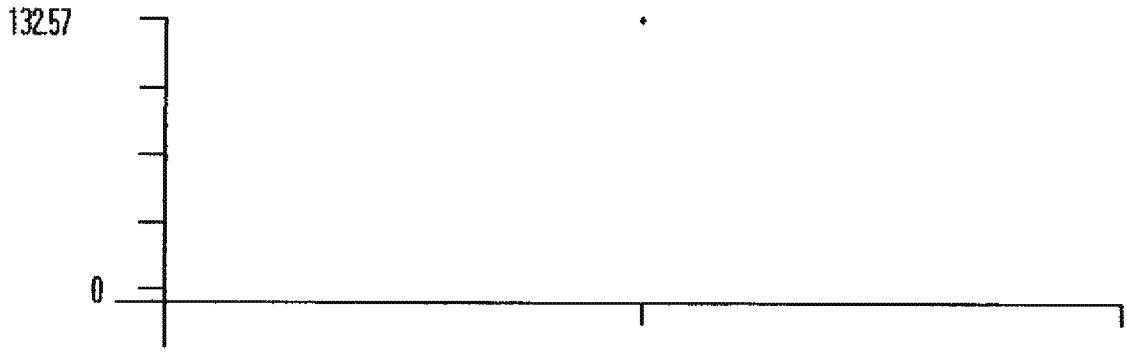
Port:	Diagnostic
Component:	ETO
Start Time:	Nov 24,2003 10:46
End Time:	Nov 24,2003 10:46
Number of points:	1
Average Value:	0.22



WBII inlet - AF.

Monitor Single Port

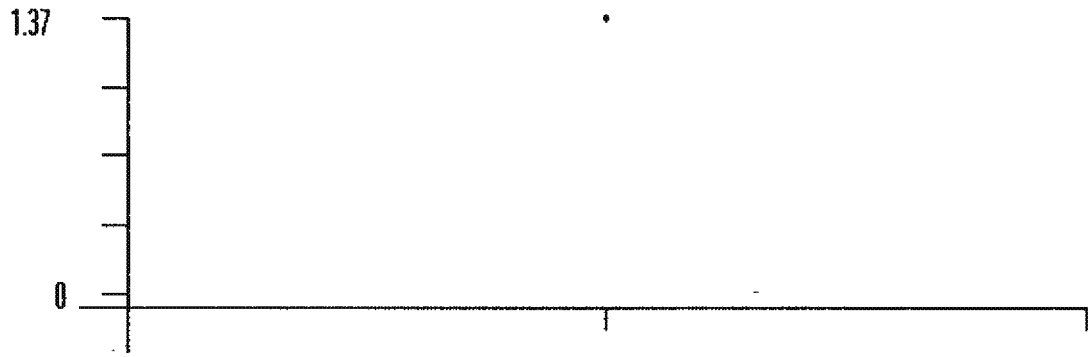
Port	Diagnostic
Component	ETO
Start Time:	Nov 24,2003 11:00
End Time:	Nov 24,2003 11:00
Number of points:	1
Average Value:	132.57



WBU outlet A.F

Monitor Single Port

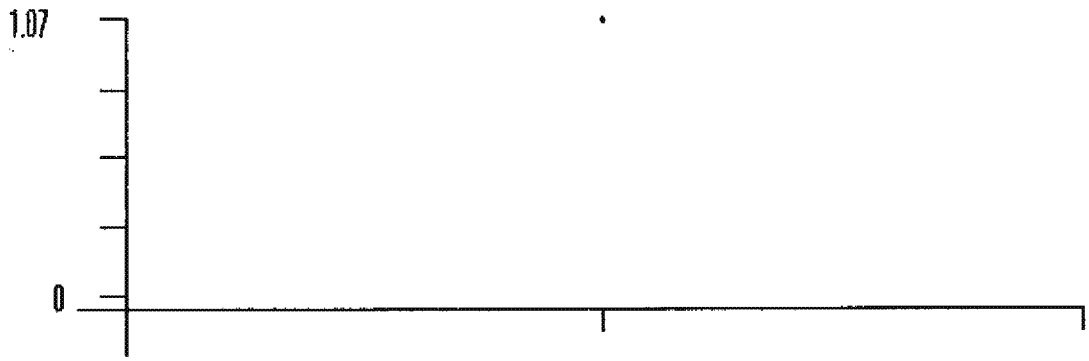
Port:	Diagnostic
Component:	ETO
Start Time:	Nov 24,2003 10:55
End Time:	Nov 24,2003 10:55
Number of points:	1
Average Value:	1.37



1.1PPM

Monitor Single Port

Port	Diagnostic
Component	ETO
Start Time:	Nov 24,2003 10:26
End Time:	Nov 24,2003 10:26
Number of points:	1
Average Value:	1.07



5.1 PPM

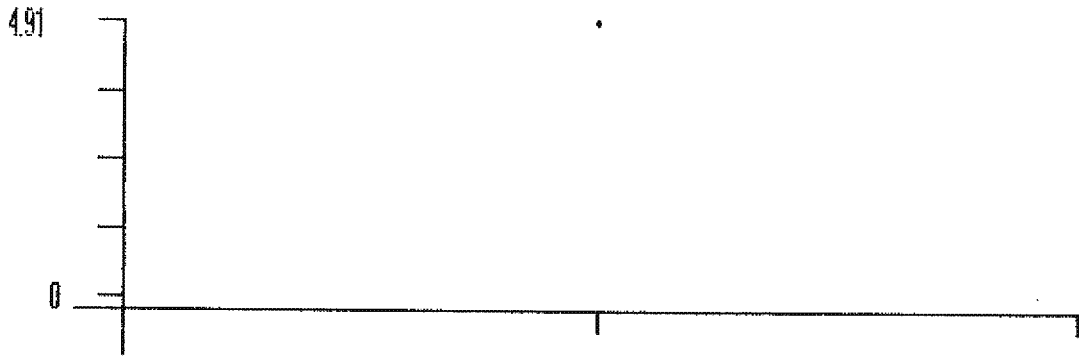
Monitor Single Port

Port	Diagnostic
Component	ETO
Start Time:	Nov 24,2003 10:18
End Time:	Nov 24,2003 10:20
Number of points:	2
Average Value:	4.84

5.18PM

Monitor Single Port

Port:	Diagnostic
Component:	ETO
Start Time:	Dec 5,2003 07:51
End Time:	Dec 5,2003 07:51
Number of points:	1
Average Value:	4.91

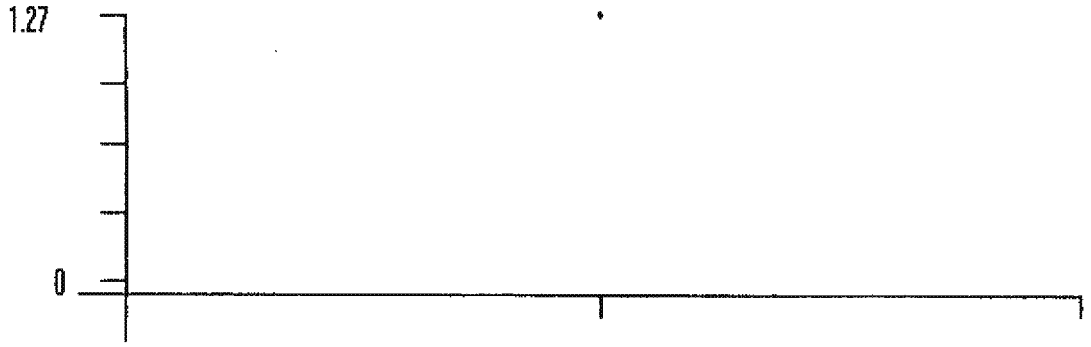


Monitor Single Port

Port: Diagnostic

Start Time: Dec 5,2003 07:56
End Time: Dec 5,2003 07:56
Number of points: 1
Average Value: 1.27

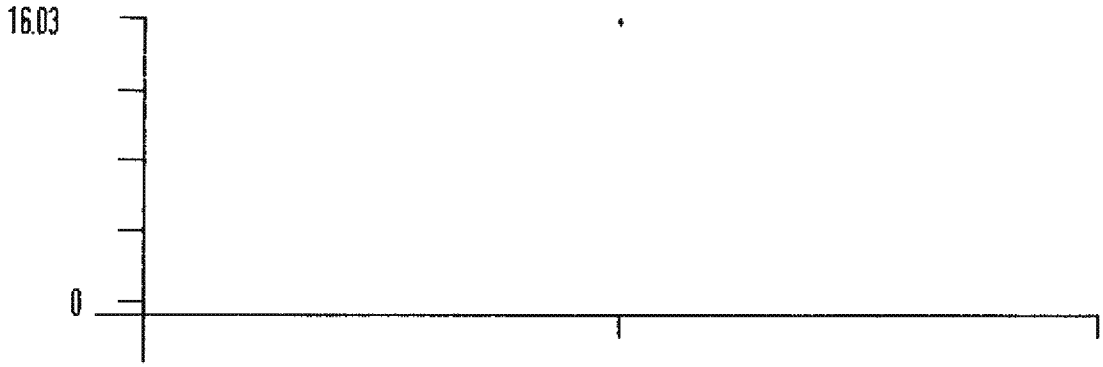
1.1 PPM



WBI inlet

Monitor Single Port

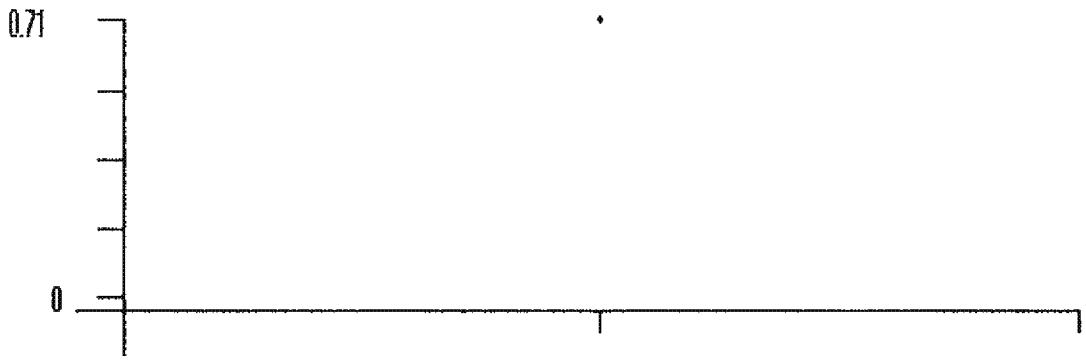
Port	Diagnostic
Component	ETO
Start Time:	Dec 5,2003 08:06
End Time:	Dec 5,2003 08:06
Number of points:	1
Average Value:	16.03



WBF outlet

Monitor Single Port

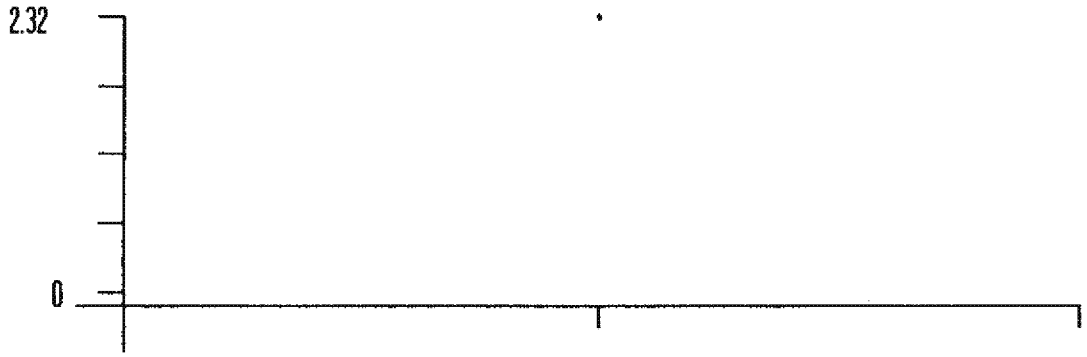
Port	Diagnostic
Component	ETO
Start Time:	Dec 5,2003 08:02
End Time:	Dec 5,2003 08:02
Number of points:	1
Average Value:	0.71



UBII inlet

Monitor Single Port

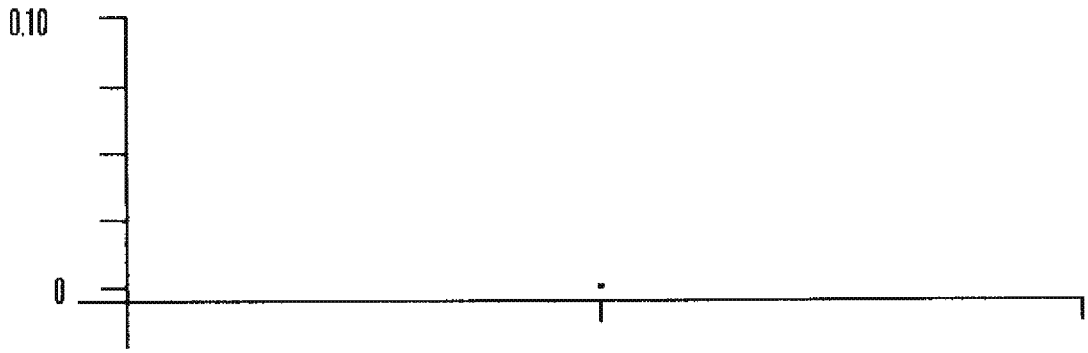
Port:	Diagnostic
Component:	ETO
Start Time:	Dec 5,2003 08:16
End Time:	Dec 5,2003 08:16
Number of points:	1
Average Value:	2.32



UBIT outlet

Monitor Single Port

Port:	Diagnostic
Component:	ETO
Start Time:	Dec 5,2003 08:11
End Time:	Dec 5,2003 08:11
Number of points:	1
Average Value:	0.00

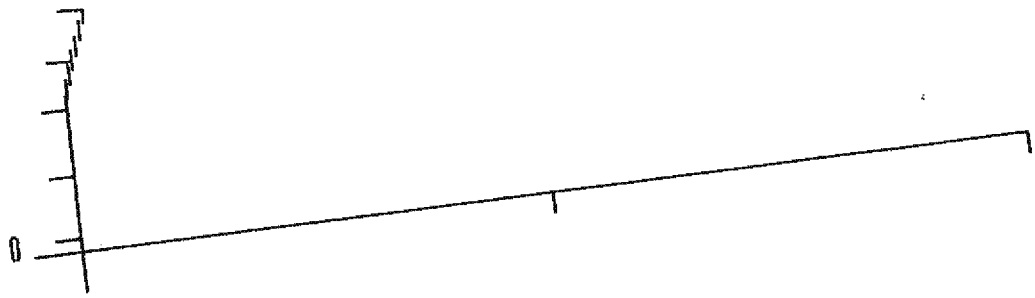


UBII inlet A.F.

Monitor Single Port

Port Diagnostic
Component ETO
Start Time: Dec 5,2003 08:25
End Time: Dec 5,2003 08:25
Number of points: 1
Average Value: 208.96

208.96



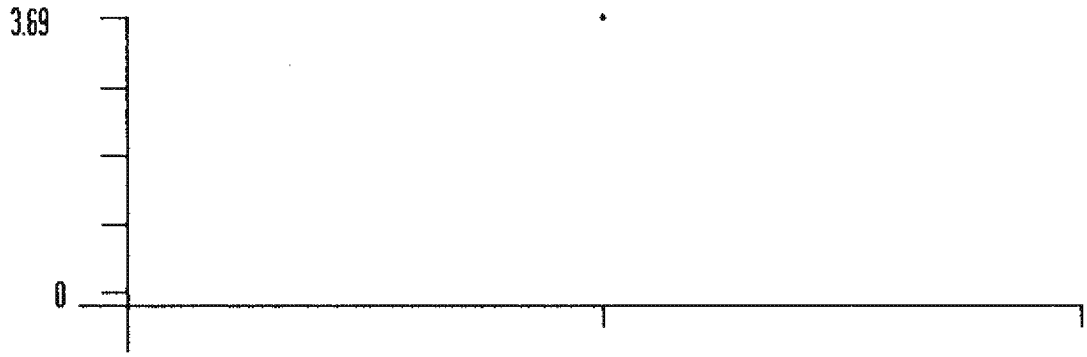
Monitor Single Port

Port Diagnostic
Component ETO
Start Time: Dec 5,2003 08:31
End Time: Dec 5,2003 08:31

UBII outlet A.F

Monitor Single Port

Port:	Diagnostic
Component:	ETO
Start Time:	Dec 5,2003 08:21
End Time:	Dec 5,2003 08:21
Number of points:	1
Average Value:	3.69

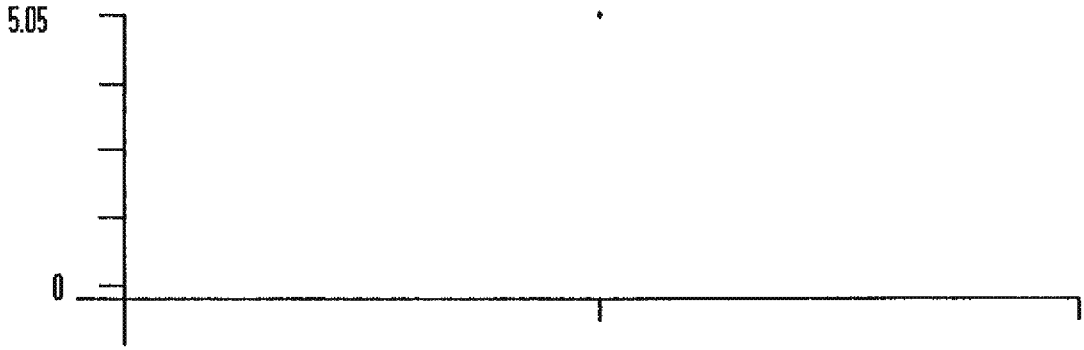


5.1 PPM

WB II

Monitor Single Port

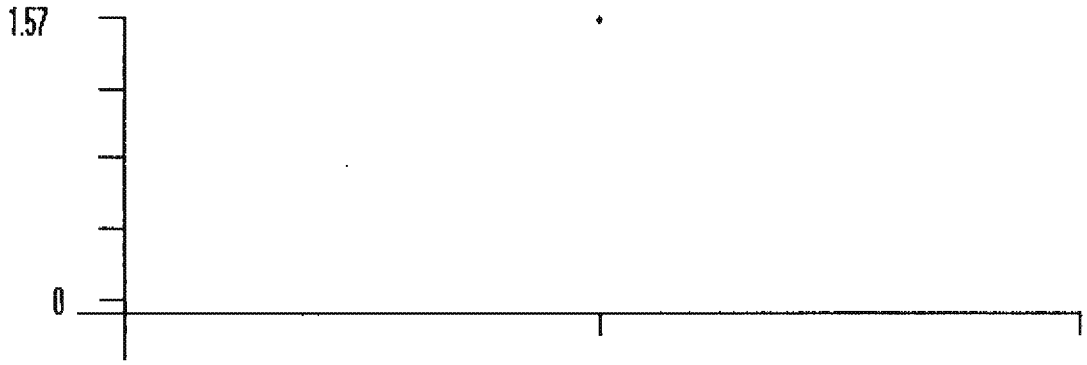
Port	Diagnostic
Component	ETO
Start Time:	Dec 10,2003 10:55
End Time:	Dec 10,2003 10:55
Number of points:	1
Average Value:	5.05



1.1 PPM

Monitor Single Port

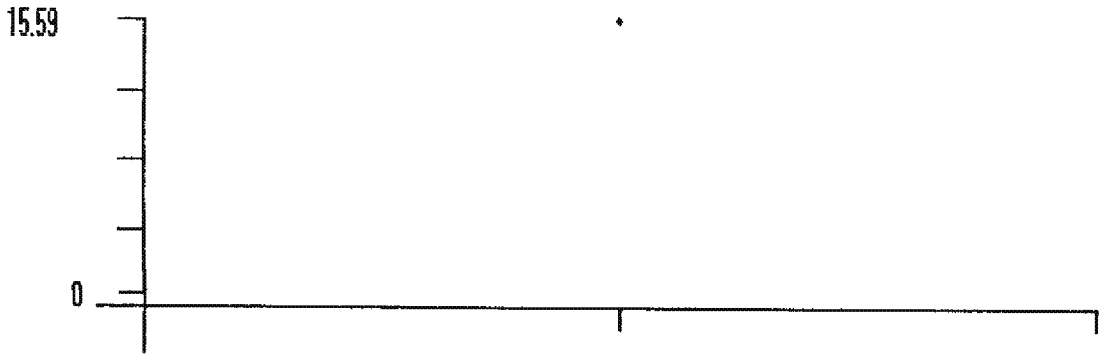
Port:	Diagnostic
Component:	ETO
Start Time:	Dec 10,2003 11:00
End Time:	Dec 10,2003 11:00
Number of points:	1
Average Value:	1.57



WBI inlet

Monitor Single Port

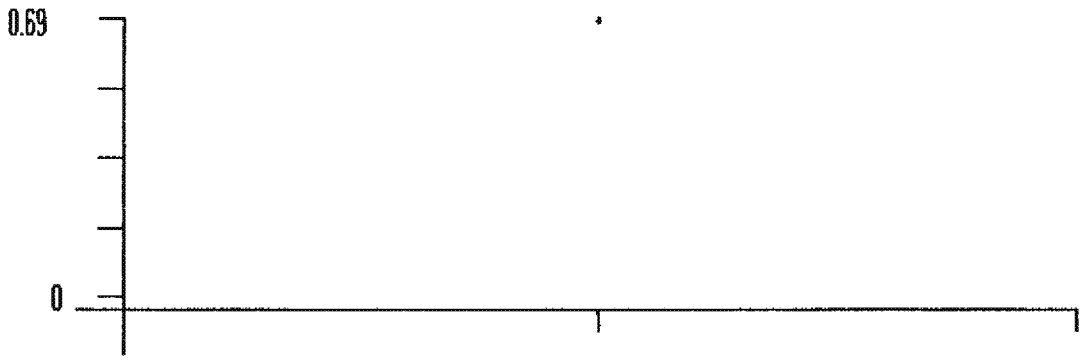
Port	Diagnostic
Component	ETO
Start Time:	Dec 10,2003 11:57
End Time:	Dec 10,2003 11:57
Number of points:	1
Average Value:	15.59



WBI outlet

Monitor Single Port

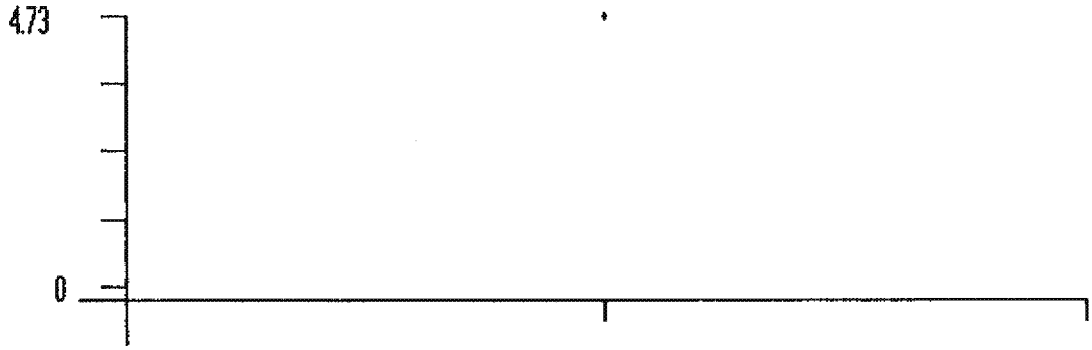
Port	Diagnostic
Component	ETO
Start Time:	Dec 10,2003 11:52
End Time:	Dec 10,2003 11:52
Number of points:	1
Average Value:	0.69



WBII inlet

Monitor Single Port

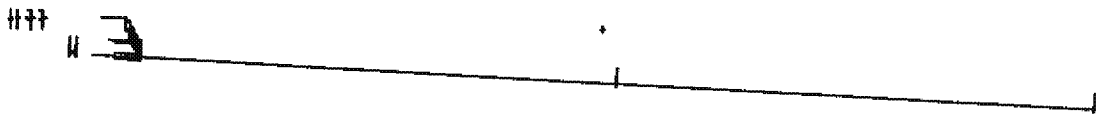
Port	Diagnostic
Component	ETO
Start Time:	Dec 10,2003 12:07
End Time:	Dec 10,2003 12:07
Number of points:	1
Average Value:	4.73



WBII outlet

Monitor Single Port

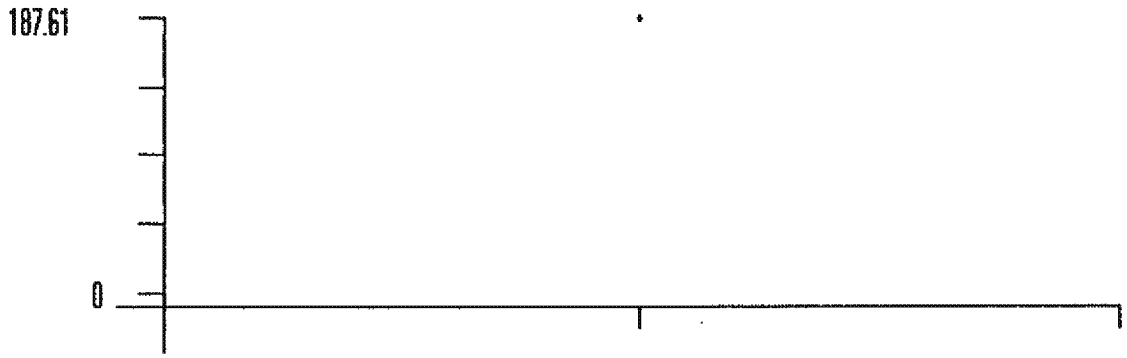
Port	Diagnostic
Component	ETO
Start Time:	Dec 10,2003 12:02
End Time:	Dec 10,2003 12:02
Number of points:	1
Average Value:	0.11



WBII inlet A.F.

Monitor Single Port

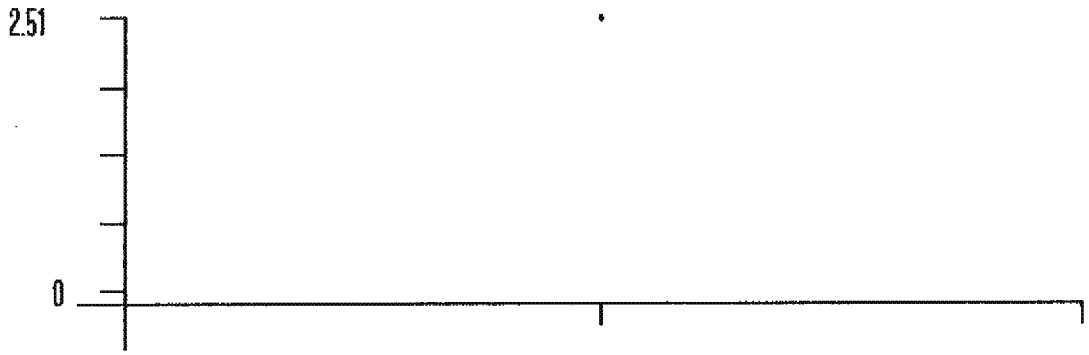
Port:	Diagnostic
Component:	ETO
Start Time:	Dec 10,2003 12:23
End Time:	Dec 10,2003 12:23
Number of points:	1
Average Value:	187.61



WBII outlet A.F

Monitor Single Port

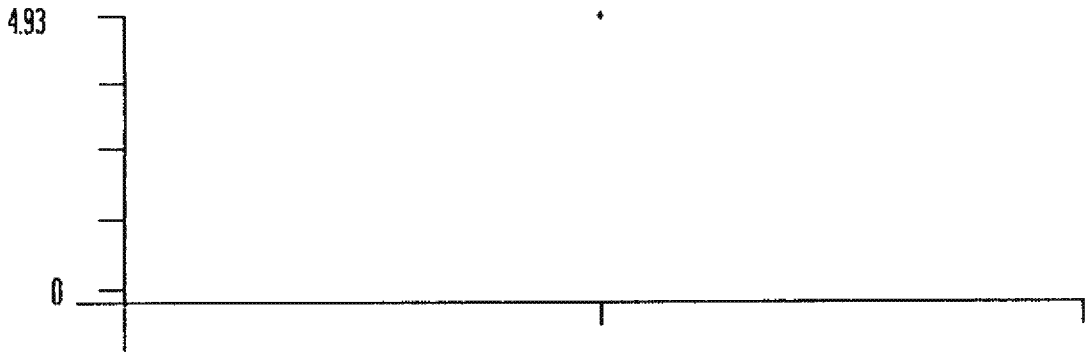
Port	Diagnostic
Component	ETO
Start Time:	Dec 10,2003 12:11
End Time:	Dec 10,2003 12:11
Number of points:	1
Average Value:	2.51



5.1 PPM

Monitor Single Port

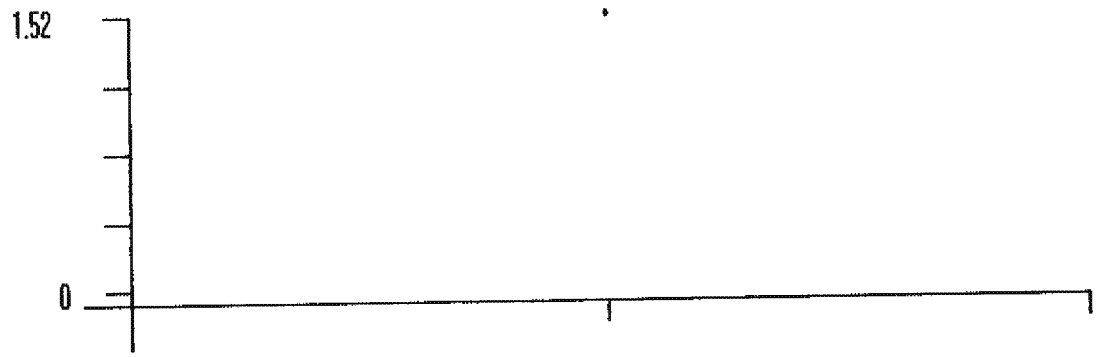
Port	Diagnostic
Component	ETO
Start Time:	Dec 18,2003 10:14
End Time:	Dec 18,2003 10:14
Number of points:	1
Average Value:	4.93



1.1 PPM

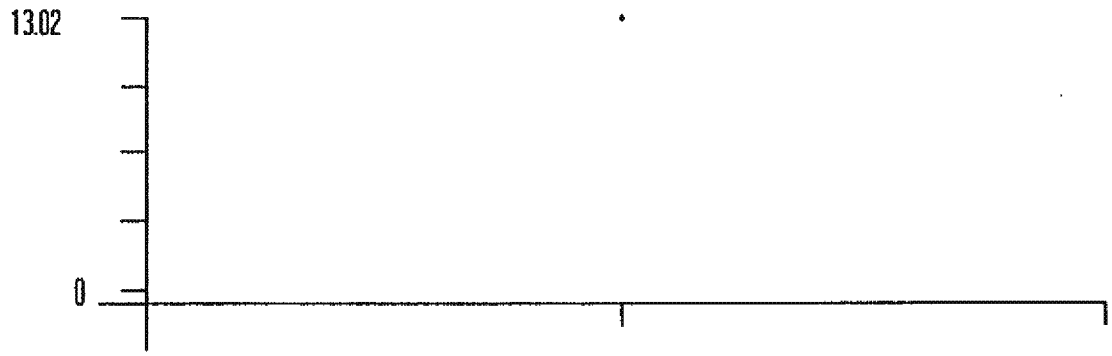
Monitor Single Port

Port:	Diagnostic
Component:	ETO
Start Time:	Dec 18,2003 10:19
End Time:	Dec 18,2003 10:19
Number of points:	1
Average Value:	1.52



WBI inlet Monitor Single Port

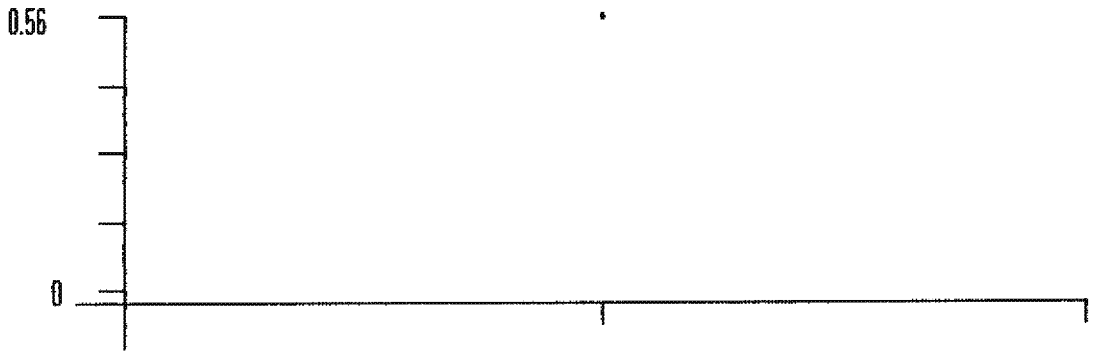
Port:	Diagnostic
Component:	ETO
Start Time:	Dec 18,2003 10:30
End Time:	Dec 18,2003 10:30
Number of points:	1
Average Value:	13.02



WBI outlet

Monitor Single Port

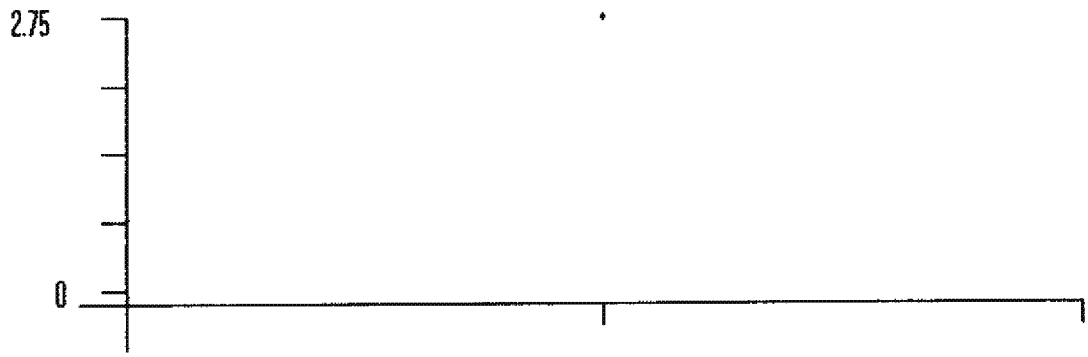
Port:	Diagnostic
Component:	ETO
Start Time:	Dec 18,2003 10:24
End Time:	Dec 18,2003 10:24
Number of points:	1
Average Value:	0.56



WB II inlet

Monitor Single Port

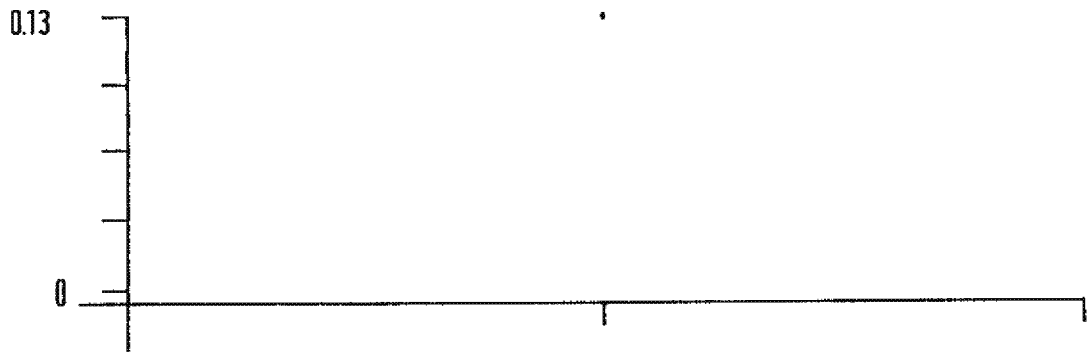
Port:	Diagnostic
Component:	ETO
Start Time:	Dec 18,2003 10:40
End Time:	Dec 18,2003 10:40
Number of points:	1
Average Value:	2.75



WBII outlet

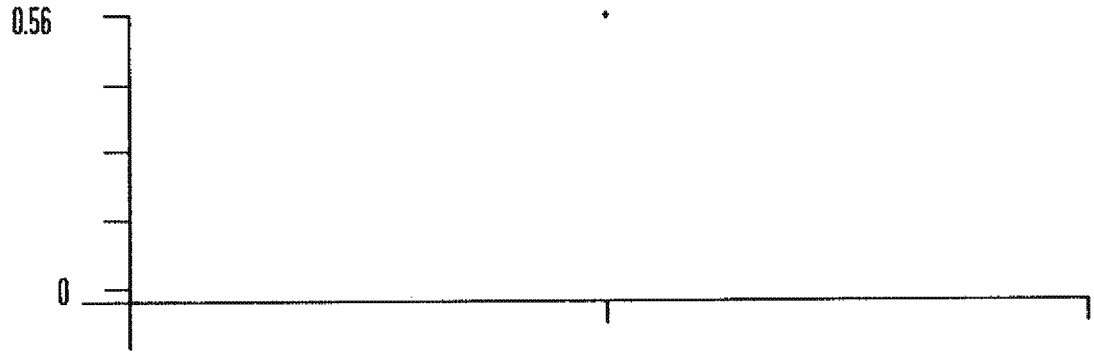
Monitor Single Port

Port	Diagnostic
Component	ETO
Start Time:	Dec 18,2003 10:35
End Time:	Dec 18,2003 10:35
Number of points:	1
Average Value:	0.13



WB II outlet A.F. Monitor Single Port

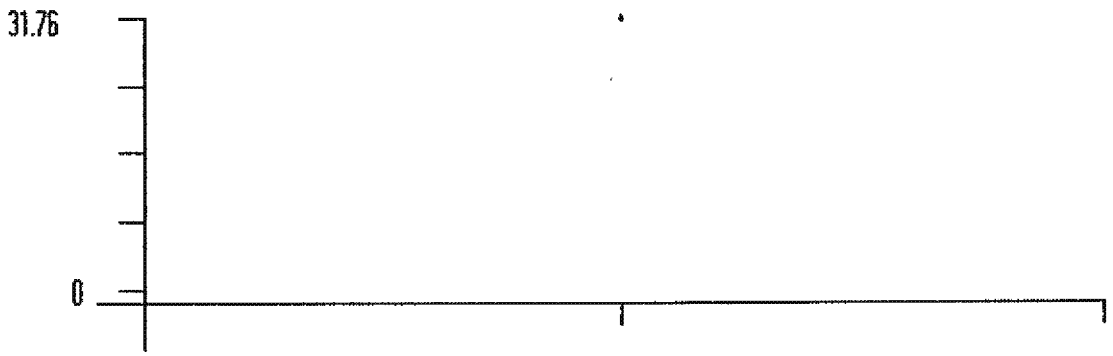
Port	Diagnostic
Component	ETO
Start Time:	Dec 18,2003 10:44
End Time:	Dec 18,2003 10:44
Number of points:	1
Average Value:	0.56



WB II inlet A.F.

Monitor Single Port

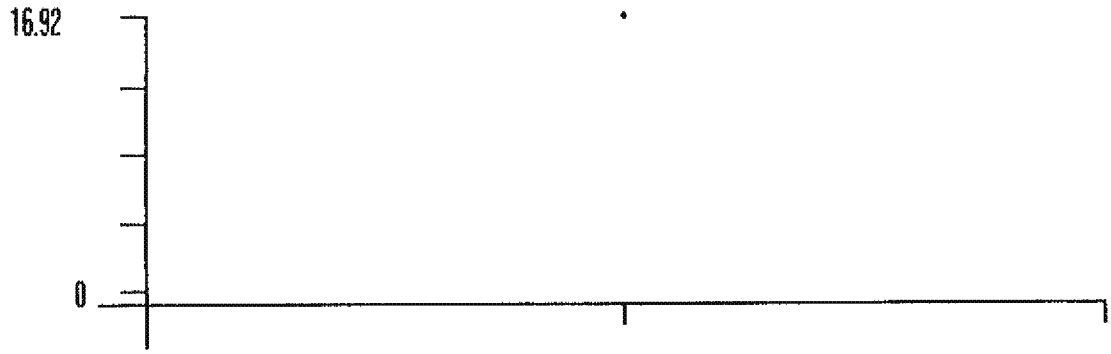
Port:	Diagnostic
Component:	ETO
Start Time:	Dec 18,2003 10:56
End Time:	Dec 18,2003 10:56
Number of points:	1
Average Value:	31.76



NB I INLET

Monitor Single Port

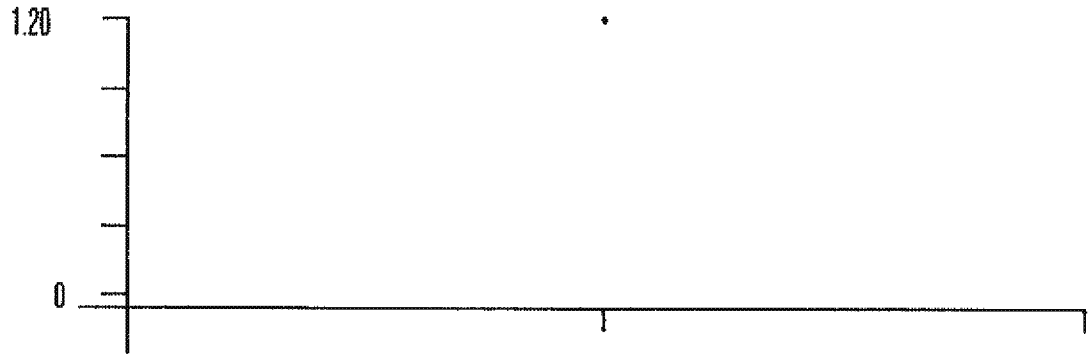
Port:	Diagnostic
Component:	ETO
Start Time:	Dec 23,2003 09:26
End Time:	Dec 23,2003 09:26
Number of points:	1
Average Value:	16.92



WB I OUTLET

Monitor Single Port

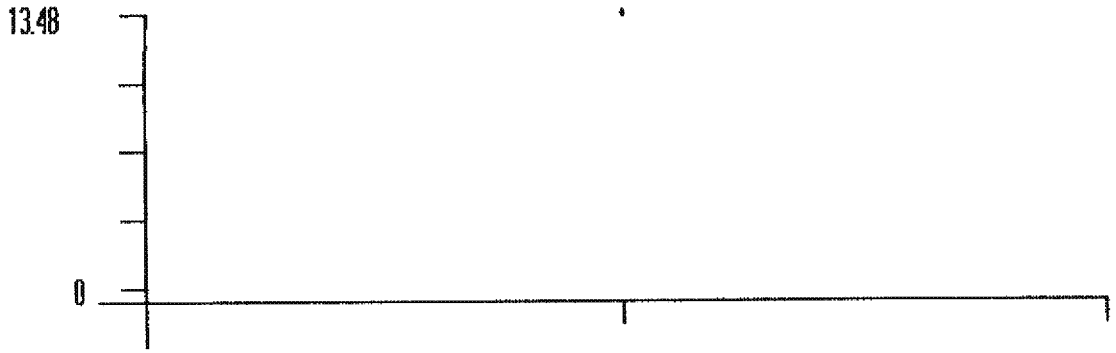
Port	Diagnostic
Component	ETO
Start Time:	Dec 23,2003 09:12
End Time:	Dec 23,2003 09:12
Number of points:	1
Average Value:	1.20



WB II INLET

Monitor Single Port

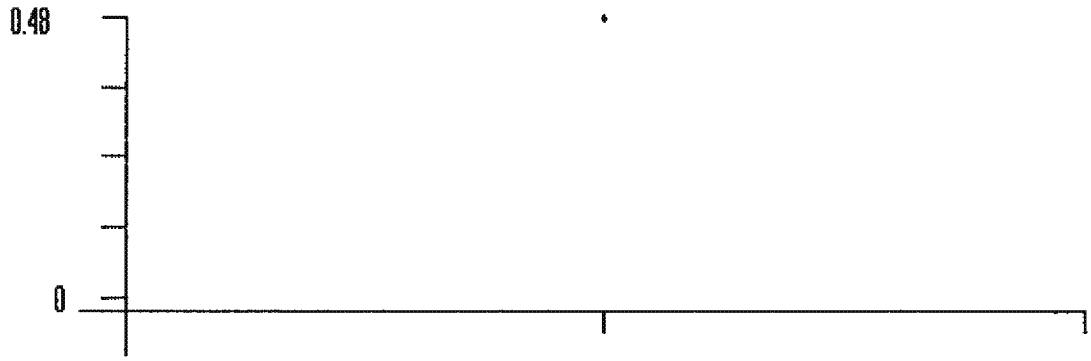
Port:	Diagnostic
Component:	ETO
Start Time:	Dec 23,2003 09:32
End Time:	Dec 23,2003 09:32
Number of points:	1
Average Value:	13.48



WB II OUTLET

Monitor Single Port

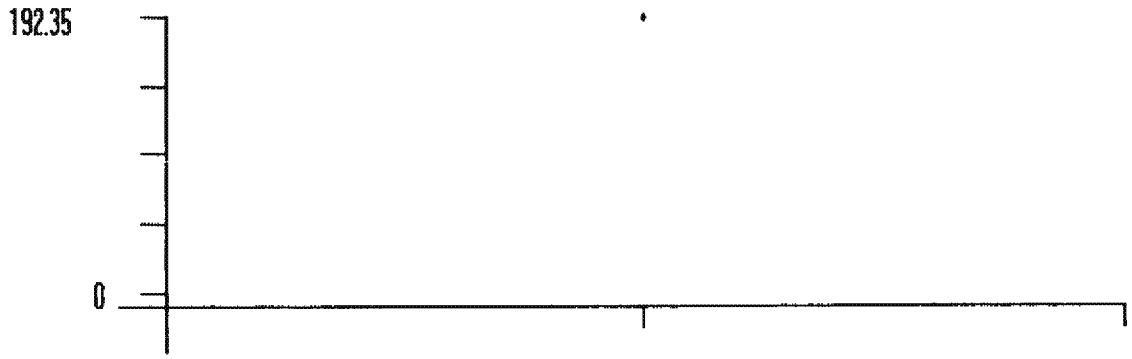
Port	Diagnostic
Component	ETO
Start Time:	Dec 23,2003 09:19
End Time:	Dec 23,2003 09:19
Number of points:	1
Average Value:	0.48



WB II INLET
AFT. VAC

Monitor Single Port

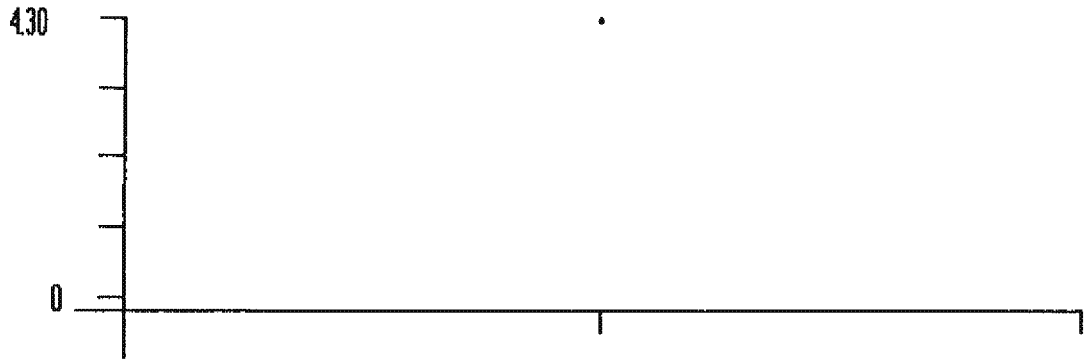
Port:	Diagnostic
Component:	ETO
Start Time:	Dec 23,2003 09:44
End Time:	Dec 23,2003 09:44
Number of points:	1
Average Value:	192.35



WB II OUTLET
AFT. VAC.

Monitor Single Port

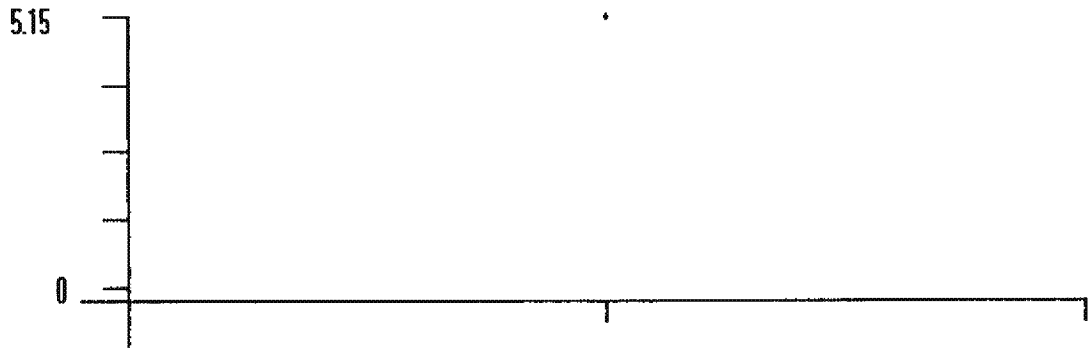
Port	Diagnostic
Component	ETO
Start Time:	Dec 23,2003 09:38
End Time:	Dec 23,2003 09:38
Number of points:	1
Average Value:	4.30



5.1 PPM
CERT. GAS

Monitor Single Port

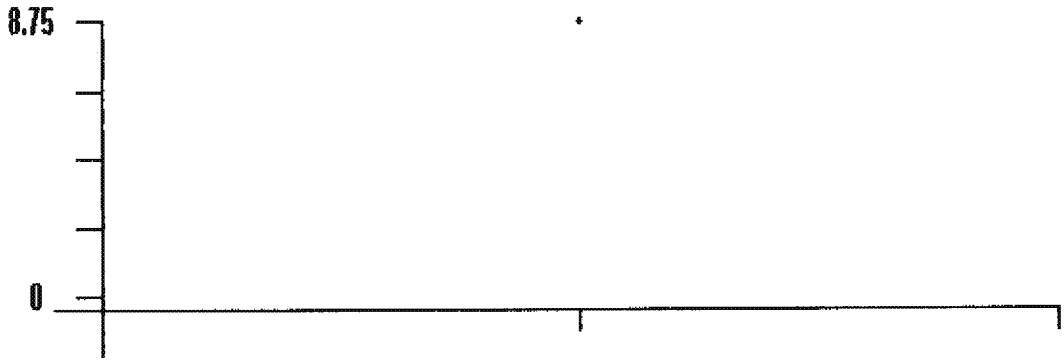
Port:	Diagnostic
Component:	ETO
Start Time:	Dec 23,2003 09:00
End Time:	Dec 23,2003 09:00
Number of points:	1
Average Value:	5.15



WBF inlet

Monitor Single Port

Port: Diagnostic
Component: ETO
Start Time: Dec 31,2003 09:15
End Time: Dec 31,2003 09:15
Number of points: 1
Average Value: 8.75

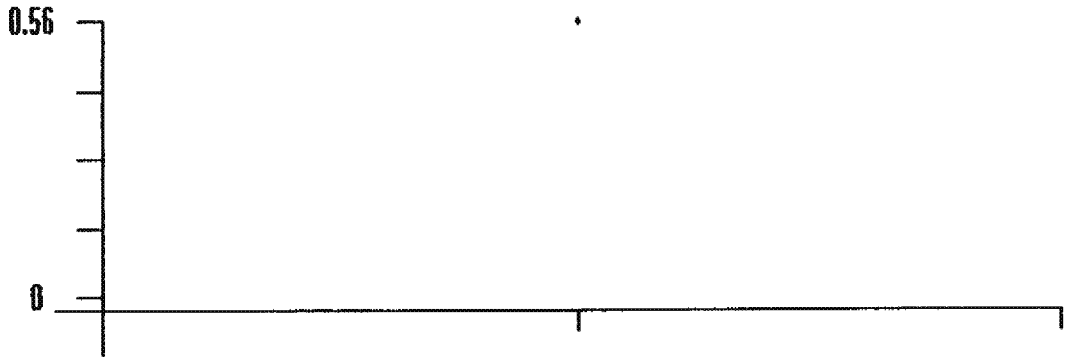


Dec/31/2003 09:15 8.75

WBI outlet

Monitor Single Port

Port: Diagnostic
Component: ETO
Start Time: Dec 31,2003 09:10
End Time: Dec 31,2003 09:10
Number of points: 1
Average Value: 0.56

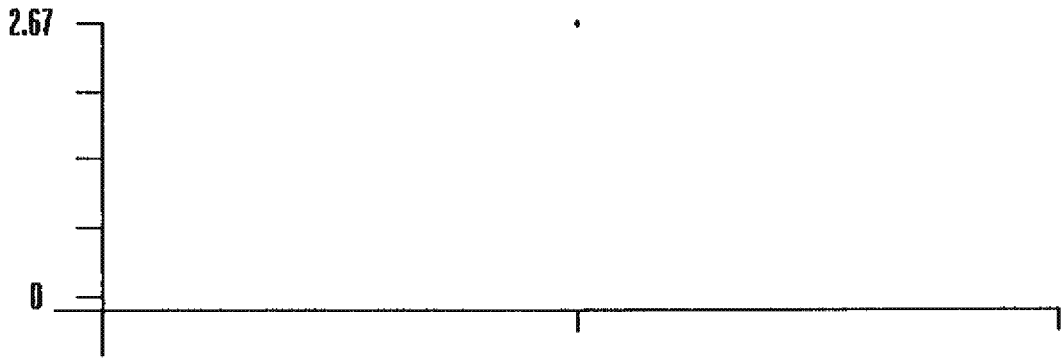


Dec/31/2003 09:10 .56

WBII inlet

Monitor Single Port

Port: Diagnostic
Component: ETO
Start Time: Dec 31,2003 09:27
End Time: Dec 31,2003 09:27
Number of points: 1
Average Value: 2.67

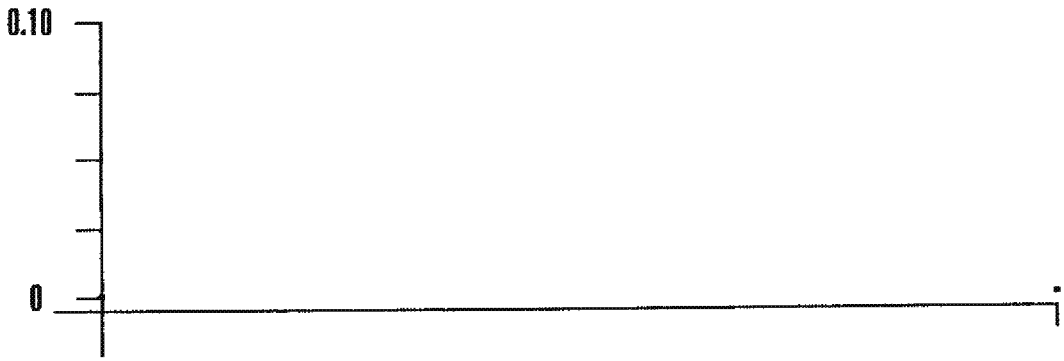


Dec/31/2003 09:27 2.67

WBII outlet

Monitor Single Port

Port: Diagnostic
Component: ETO
Start Time: Dec 31,2003 09:20
End Time: Dec 31,2003 09:22
Number of points: 2
Average Value: 0.00

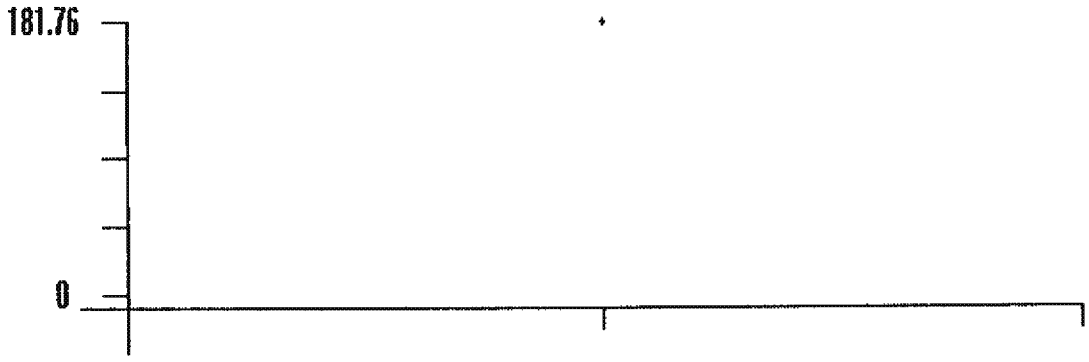


Dec/31/2003 09:20	.00
Dec/31/2003 09:22	.00

WBII inlet A.F.

Monitor Single Port

Port: Diagnostic
Component: ETO
Start Time: Dec 31,2003 09:36
End Time: Dec 31,2003 09:36
Number of points: 1
Average Value: 181.76

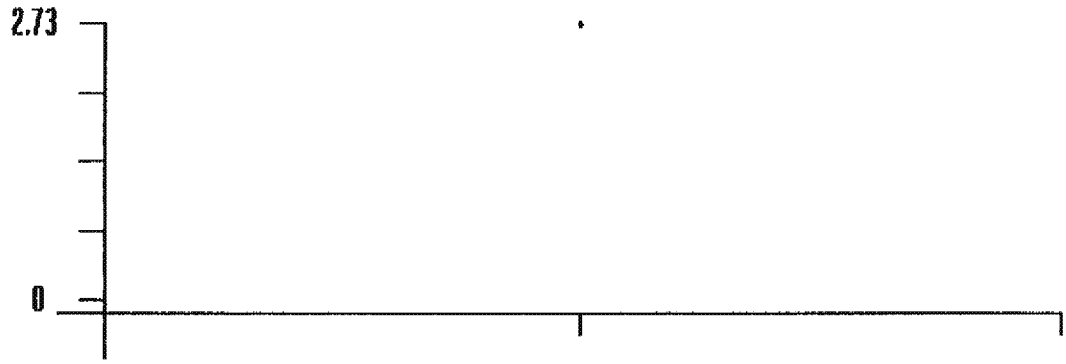


Dec/31/2003 09:36 181.76

UB II outlet A, F

Monitor Single Port

Port: Diagnostic
Component: ETO
Start Time: Dec 31,2003 09:32
End Time: Dec 31,2003 09:32
Number of points: 1
Average Value: 2.73



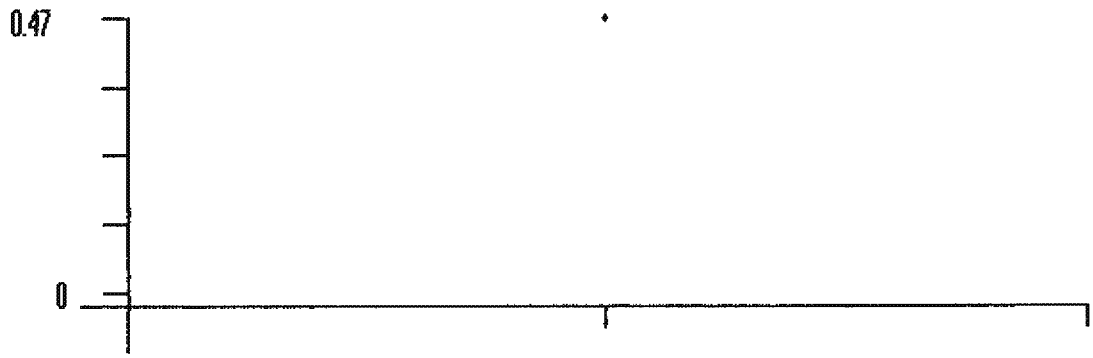
Dec/31/2003 09:32 2.73

WBA outlet

A.F.

Monitor Single Port

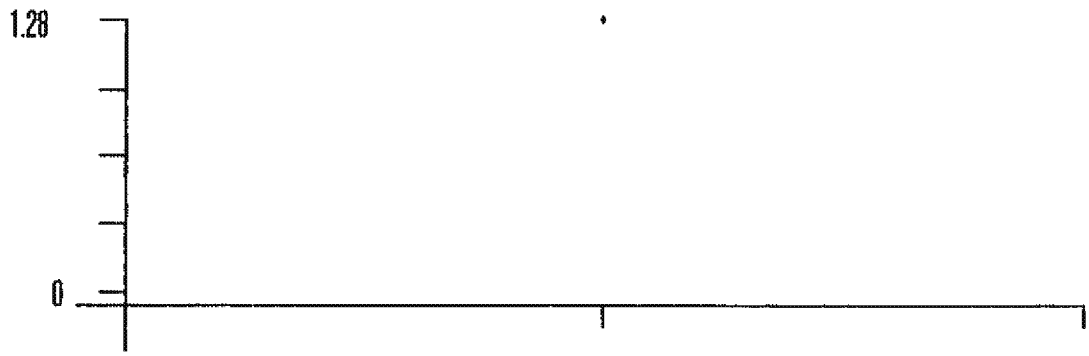
Port:	Diagnostic
Component:	ETO
Start Time:	Oct 28,2003 10:49
End Time:	Oct 28,2003 10:49
Number of points:	1
Average Value:	0.47



1.18 PPM

Monitor Single Port

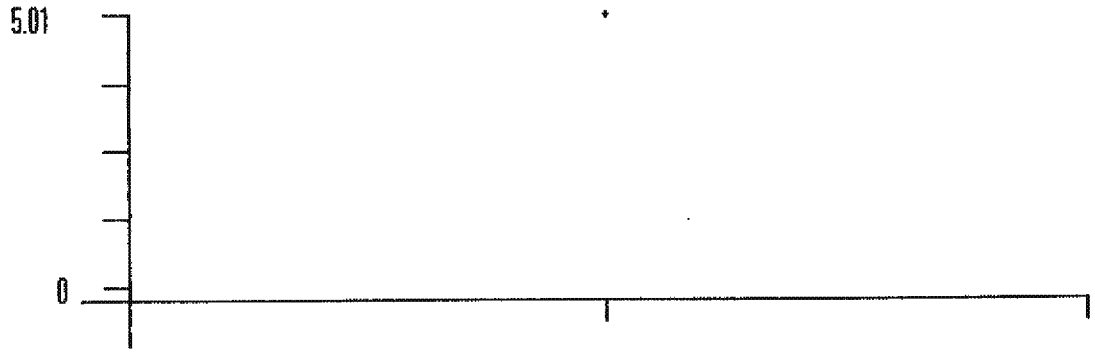
Port	Diagnostic
Component	ETO
Start Time:	Oct 28,2003 10:24
End Time:	Oct 28,2003 10:24
Number of points:	1
Average Value:	1.28



5.1 PPM

Monitor Single Port

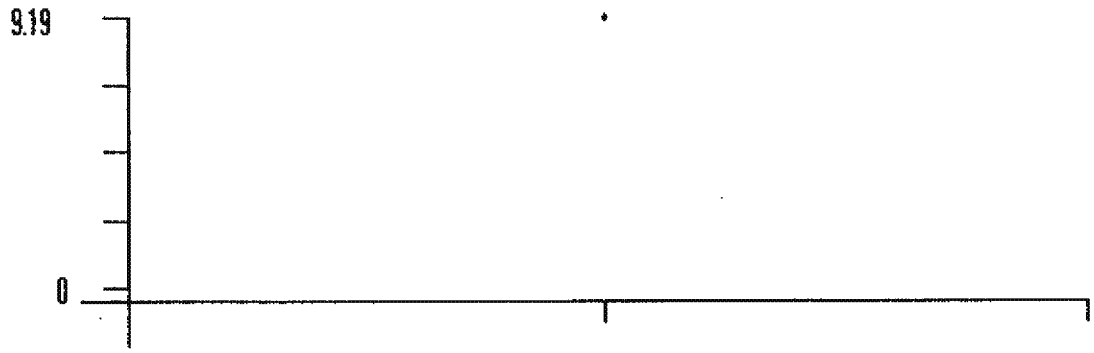
Port:	Diagnostic
Component:	ETO
Start Time:	Oct 28,2003 10:13
End Time:	Oct 28,2003 10:13
Number of points:	1
Average Value:	5.01



WBI inlet

Monitor Single Port

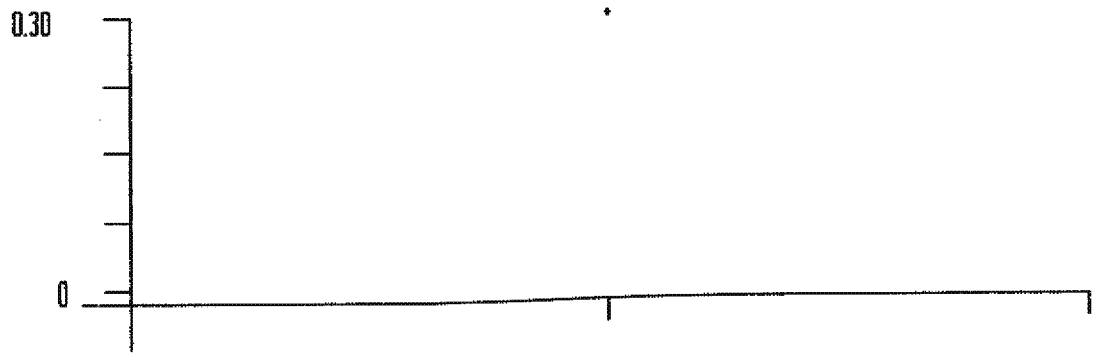
Port:	Diagnostic
Component:	ETO
Start Time:	Nov 6,2003 08:15
End Time:	Nov 6,2003 08:15
Number of points:	1
Average Value:	9.19



WBI outlet

Monitor Single Port

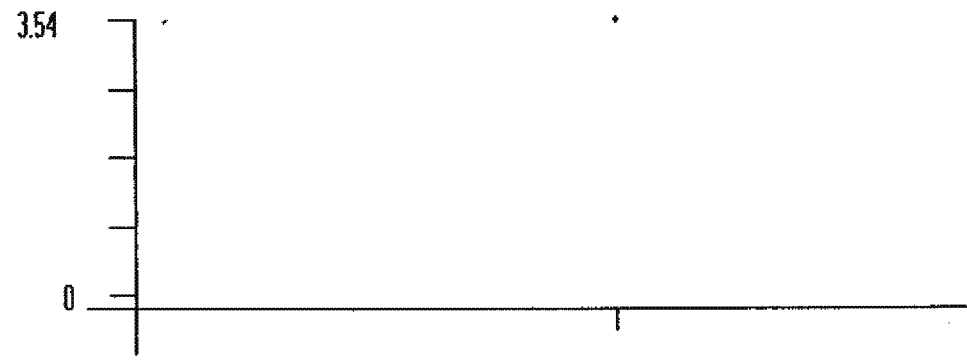
Port	Diagnostic
Component:	ETO
Start Time:	Nov 6,2003 08:07
End Time:	Nov 6,2003 08:07
Number of points:	1
Average Value:	0.30



WBH inlet

Monitor Single Port

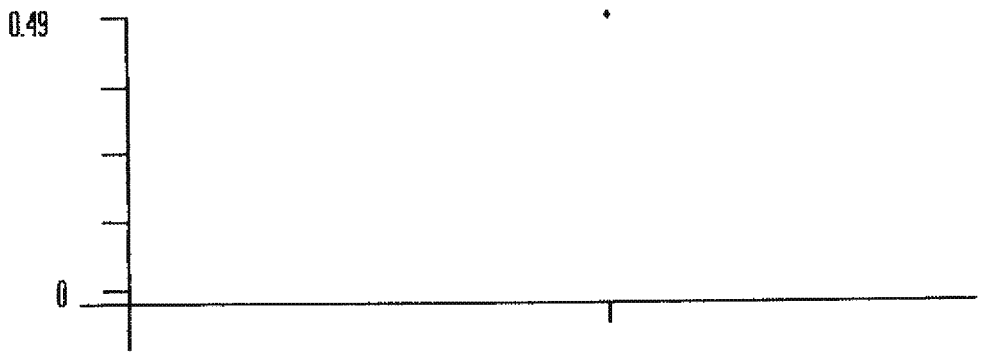
Port:	Diagnostic
Component:	ETO
Start Time:	Nov 6,2003 08:26
End Time:	Nov 6,2003 08:26
Number of points:	1
Average Value:	3.54



WBII outlet

Monitor Single Port

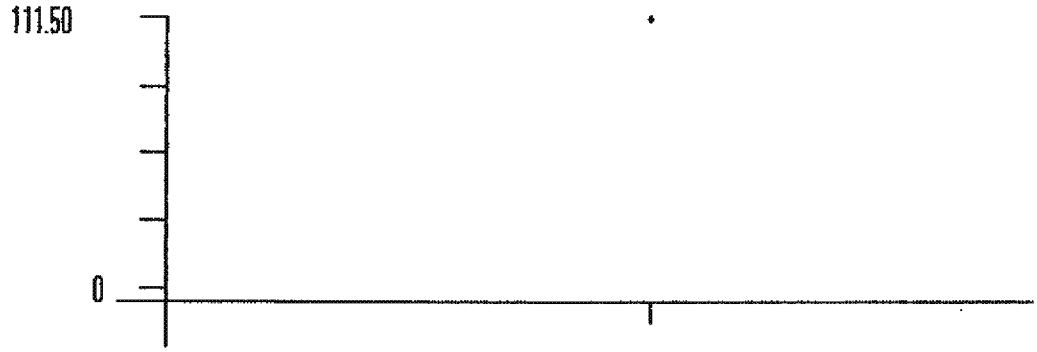
Port:	Diagnostic
Component:	ETO
Start Time:	Nov 6,2003 08:32
End Time:	Nov 6,2003 08:32
Number of points:	1
Average Value:	0.49



WBII outlet A.F

Monitor Single Port

Port:	Diagnostic
Component:	ETO
Start Time:	Nov 6,2003 09:06
End Time:	Nov 6,2003 09:06
Number of points:	1
Average Value:	111.50

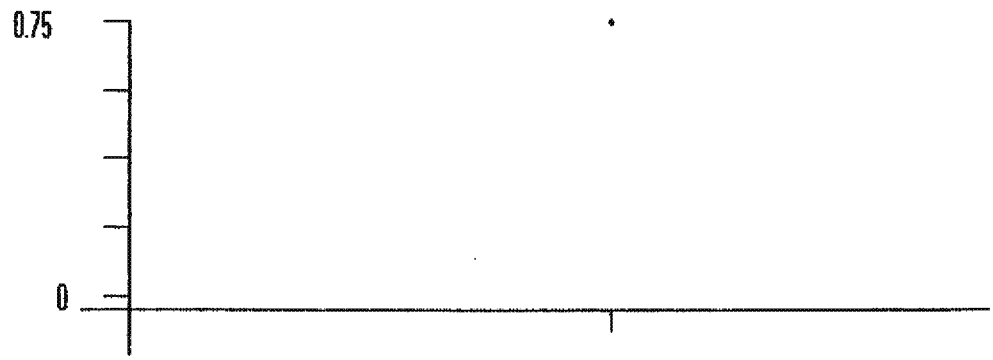


WBII outlet

A.F.

Monitor Single Port

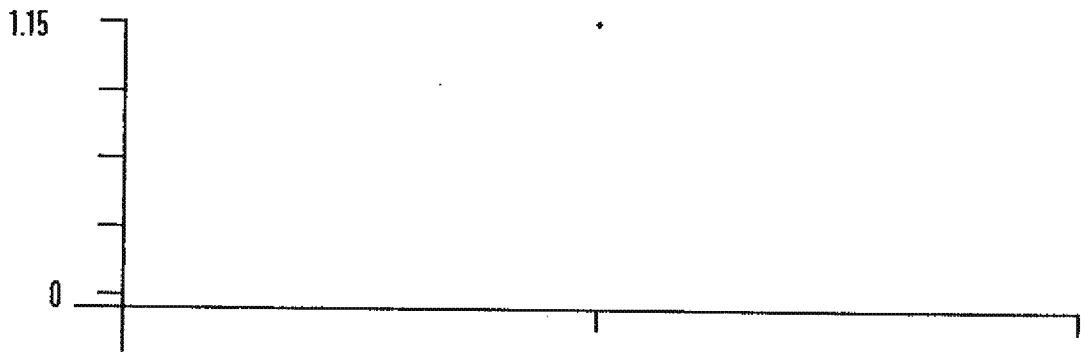
Port	Diagnostic
Component	ETO
Start Time:	Nov 6,2003 08:38
End Time:	Nov 6,2003 08:38
Number of points:	1
Average Value:	0.75



1:18PM

Monitor Single Port

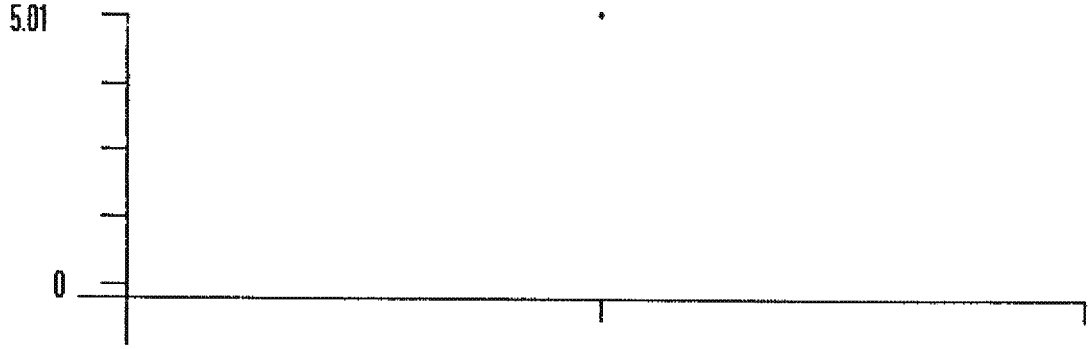
Port	Diagnostic
Component	ETO
Start Time:	Nov 6,2003 08:03
End Time:	Nov 6,2003 08:03
Number of points:	1
Average Value:	1.15



5.1 PPM

Monitor Single Port

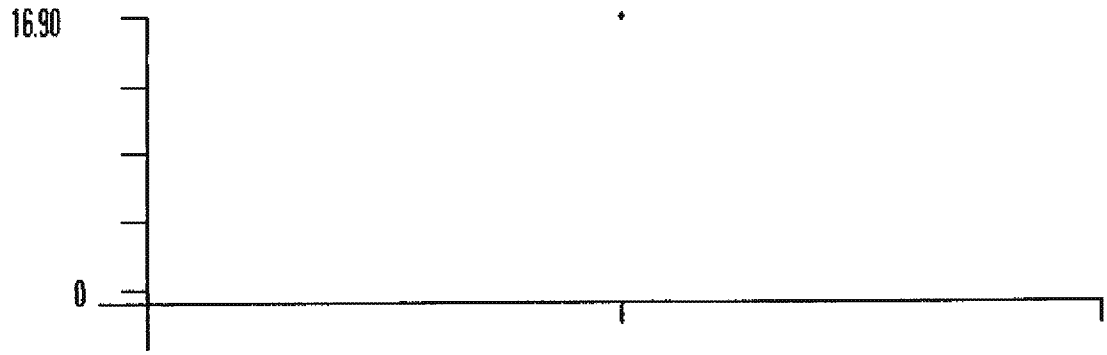
Port:	Diagnostic
Component:	ETO
Start Time:	Nov 6,2003 07:54
End Time:	Nov 6,2003 07:54
Number of points:	1
Average Value:	5.01



WB 1
IN

Monitor Single Port

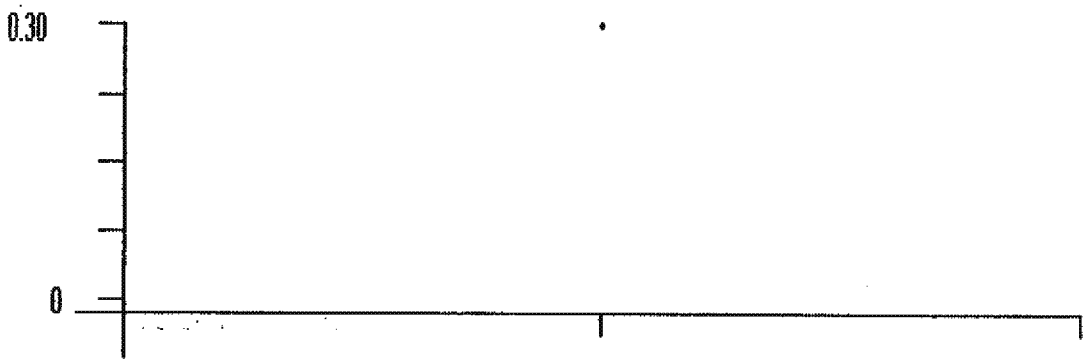
Port	Diagnostic
Component	ETO
Start Time:	Nov 12 2003 11:09
End Time:	Nov 12,2003 11:09
Number of points:	1
Average Value:	16.90



WBI outlet

Monitor Single Port

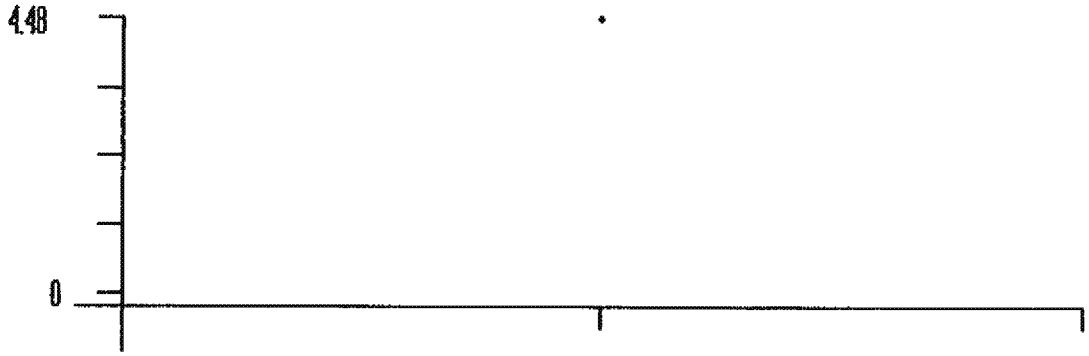
Port:	Diagnostic
Component:	ETO
Start Time:	Nov 12,2003 15:49
End Time:	Nov 12,2003 15:49
Number of points:	1
Average Value:	0.30



WBI INLB

Monitor Single Port

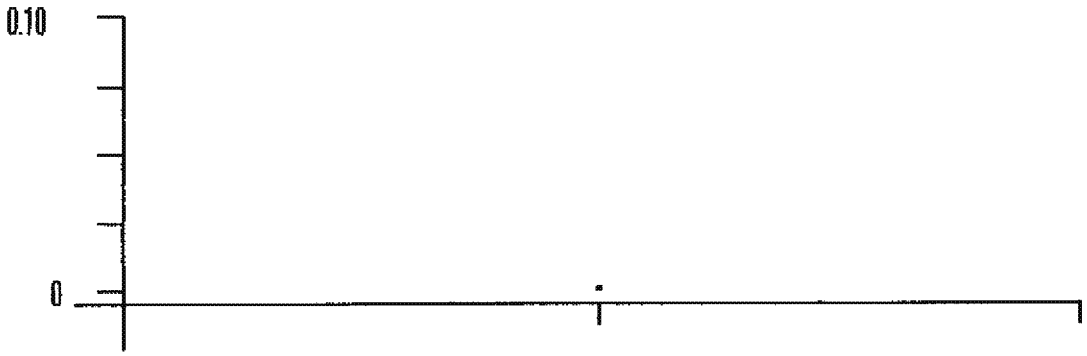
Port	Diagnostic
Component	ETO
Start Time:	Nov 12,2003 11:37
End Time:	Nov 12,2003 11:37
Number of points:	1
Average Value:	4.48



WB II
OOT

Monitor Single Port

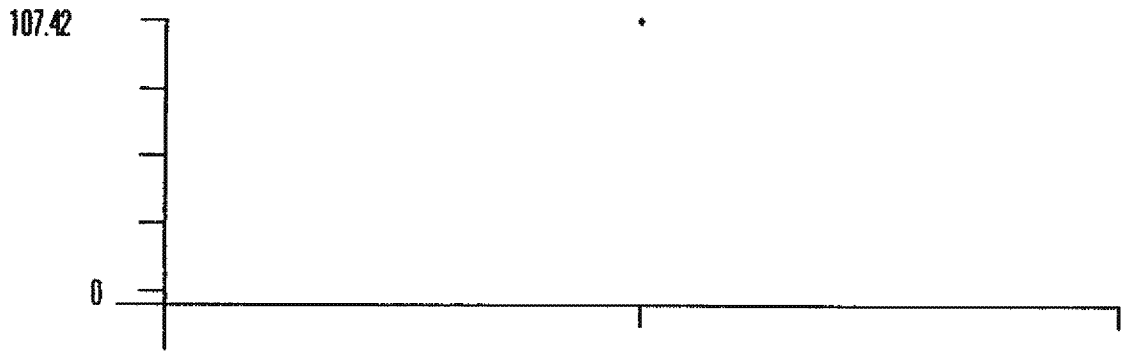
Port: Diagnostic
Component: ETO
Start Time: Nov 12,2003 11:31
End Time: Nov 12,2003 11:31
Number of points: 1
Average Value: 0.00



WB II
IN
AR

Monitor Single Port

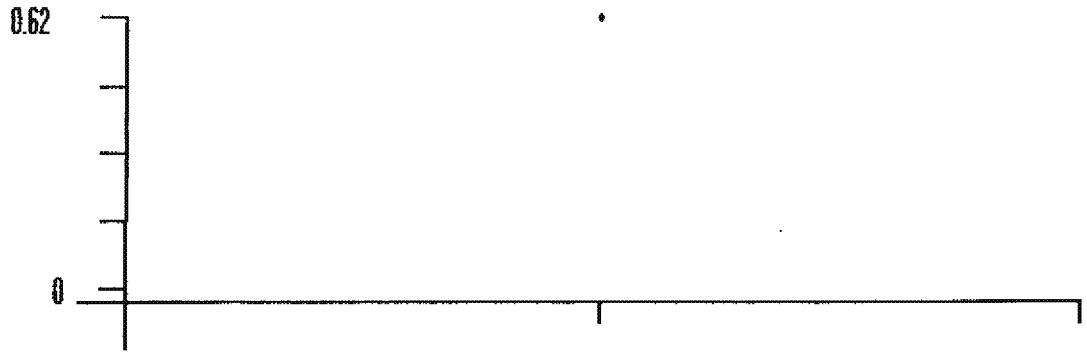
Port	Diagnostic
Component	ETO
Start Time:	Nov 12,2003 11:58
End Time:	Nov 12,2003 11:58
Number of points:	1
Average Value:	107.42



WB II
OUT AFTER VAC.

Monitor Single Port

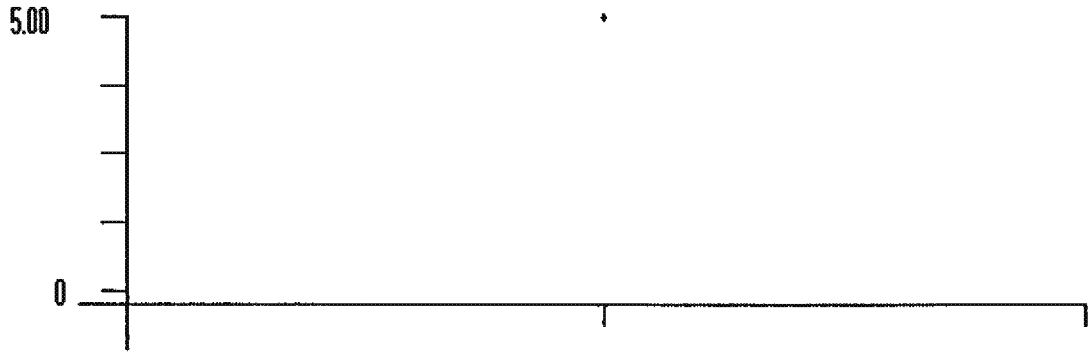
Port:	Diagnostic
Component:	ETO
Start Time:	Nov 12,2003 11:53
End Time:	Nov 12,2003 11:53
Number of points:	1
Average Value:	0.62



Monitor Single Port

5.1 ppm

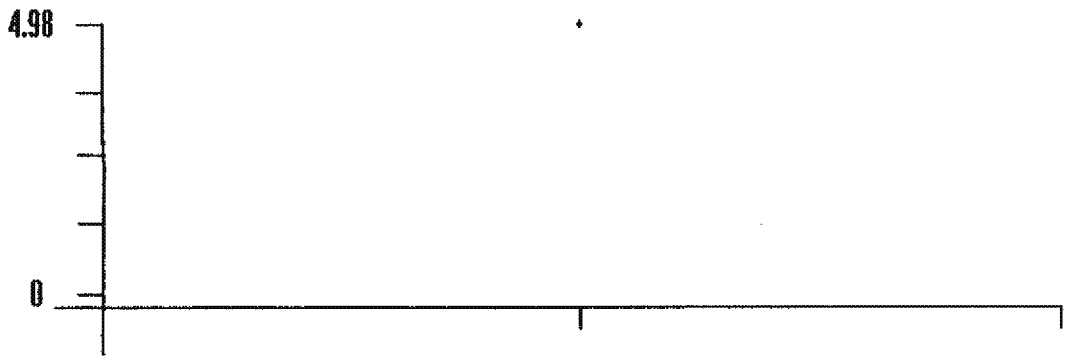
Port:	Diagnostic
Component:	ETO
Start Time:	Nov 12,2003 10:52
End Time:	Nov 12,2003 10:52
Number of points:	1
Average Value:	5.00



5.1 PPM

Monitor Single Port

Port: Diagnostic
Component: ETO
Start Time: Dec 31,2003 08:54
End Time: Dec 31,2003 08:54
Number of points: 1
Average Value: 4.98



Dec/31/2003 08:54 4.98

ATTACHMENT B

WILLOWBROOK I & II
Fourth QUARTER
(October to December 2003)

AERATION ROOM & CHAMBER DISCHARGE TESTING
BASELINE RESULTS

rt1 00:00:54

of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1003030355, 11:01:28 AM, Port_09 9, 9, 0

Substance, Samples, Present counts, Concentration
1 ETO, 31, 280219, 20.6 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 4.17 ppm, 01:05:58

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 7.09 ppm, 5

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01

bf1 00:00:35 on1 00:00:50 rt1 00:00:56

of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1003030356, 11:03:40 AM, Port_09 9, 10, 0

Substance, Samples, Present counts, Concentration
1 ETO, 32, 135587, 9.97 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 4.53 ppm, 01:08:10

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 8.45 ppm, 5

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01

bf1 00:00:35 on1 00:00:50 rt1 00:00:56

of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1003030357, 11:05:49 AM, Port_09 9, 11, 0

Substance, Samples, Present counts, Concentration
1 ETO, 33, 168410, 12.4 ppm WBII inlet

Substance, Time Weighted Average, Time Interval
1 ETO, 4.73 ppm, 01:10:19 A.F

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 9.88 ppm, 5

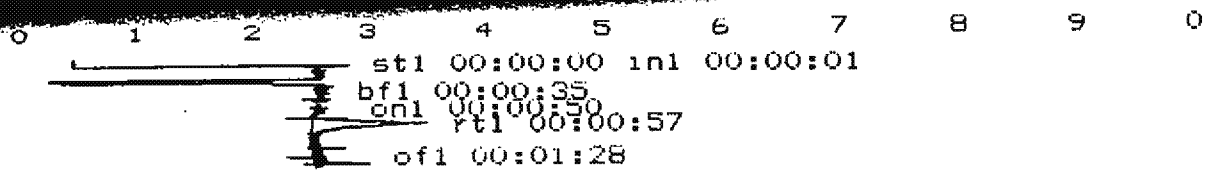
0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01

bf1 00:00:35 on1 00:00:50 rt1 00:00:54

of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

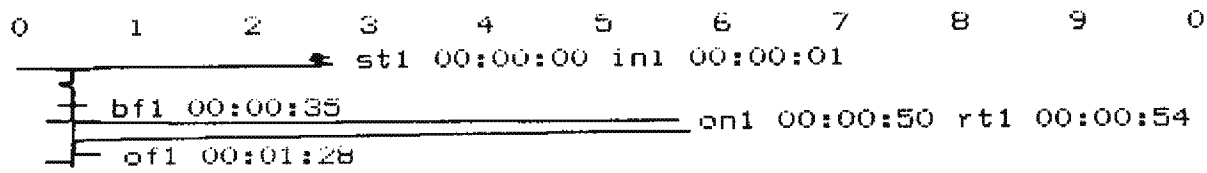


Run number, Inject time, Port name and number, Lows, Highs
1003030352, 10:55:23 AM, Port_07 7, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 1, 13267, 0.975 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, <MDQ, 00:00:00

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.975 ppm, 1

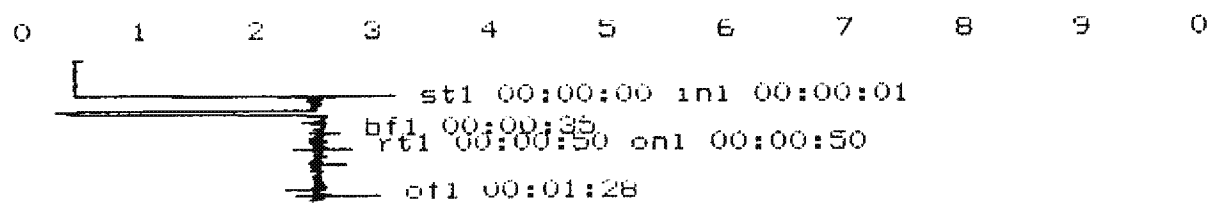


Run number, Inject time, Port name and number, Lows, Highs
1003030353, 10:57:19 AM, Port_04 4, 1, 0

Substance, Samples, Present counts, Concentration
1 ETO, 1, 245422, 18.0 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, <MDQ, 00:00:00

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 18.0 ppm, 1

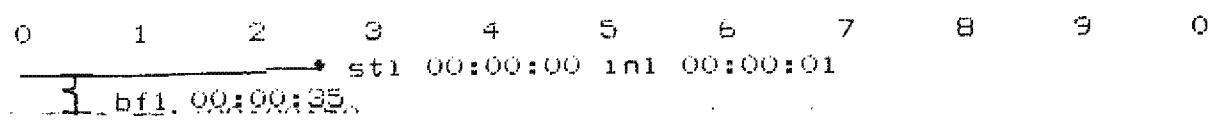


Run number, Inject time, Port name and number, Lows, Highs
1003030354, 10:59:34 AM, Port_05 5, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 1, 387, <MDQ

Substance, Time Weighted Average, Time Interval
1 ETO, <MDQ, 00:00:00

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, <MDQ, 1



Substance, Samples, Present counts, Concentration
1 ETO, 27, 169936, 12.5 ppm W Blanket

Substance, Time Weighted Average, Time Interval
1 ETO, 3.38 ppm, 00:51:53

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 4.69 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:57
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1003030349, 10:49:40 AM, Port_09 9, 8, 0

Substance, Samples, Present counts, Concentration
1 ETO, 28, 11275, 0.829 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 3.52 ppm, 00:54:10

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 5.62 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00
in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:58
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1003030350, 10:51:35 AM, Port_09 9, 8, 0

Substance, Samples, Present counts, Concentration
1 ETO, 29, 12413, 0.913 ppm

Substance, Time weighted Average, Time Interval
1 ETO, 3.43 ppm, 00:56:05

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 5.71 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:57
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1003030351, 10:53:30 AM, Port_09 9, 8, 0

Substance, Samples, Present counts, Concentration
1 ETO, 30, 307, <MDQ W B II Outlet

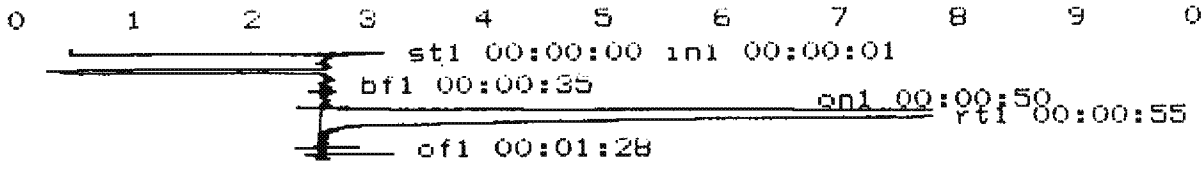
Substance, Time Weighted Average, Time Interval
[illegible] ppm, 00:58:00 A.F

Run number, Inject time, Port name and number, Lows, Highs
1003030345, 10:41:08 AM, Port_09 9, 5, 0

Substance, Samples, Present counts, Concentration
1 ETO, 24, 179, <MDQ

Substance, Time Weighted Average, Time Interval
1 ETO, 2.44 ppm, 00:45:38

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 3.24 ppm, 8

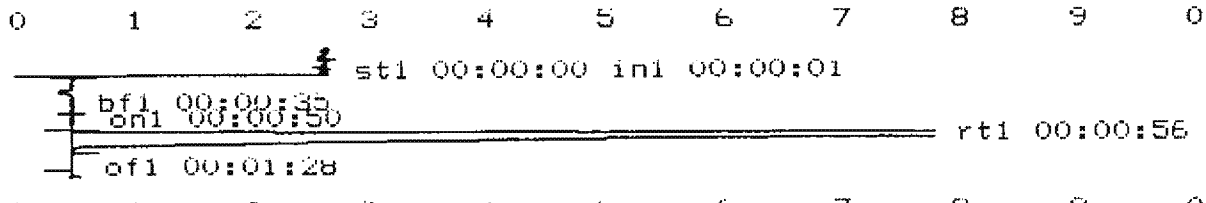


Run number, Inject time, Port name and number, Lows, Highs
1003030346, 10:43:02 AM, Port_09 9, 6, 0

Substance, Samples, Present counts, Concentration
1 ETO, 25, 161097, 11.8 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 2.58 ppm, 00:47:32

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 2.83 ppm, 8

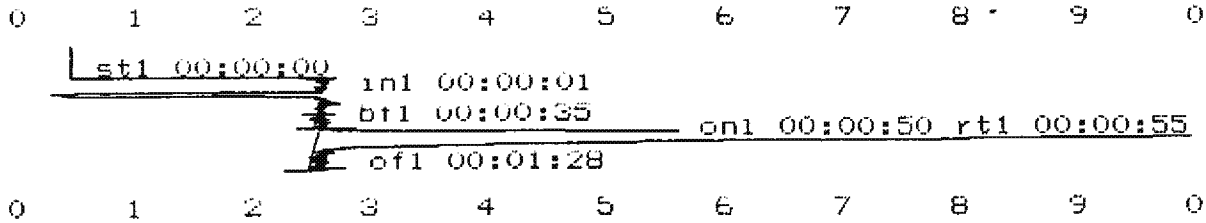


Run number, Inject time, Port name and number, Lows, Highs
1003030347, 10:45:12 AM, Port_09 9, 7, 0

Substance, Samples, Present counts, Concentration
1 ETO, 26, 164107, 12.1 ppm

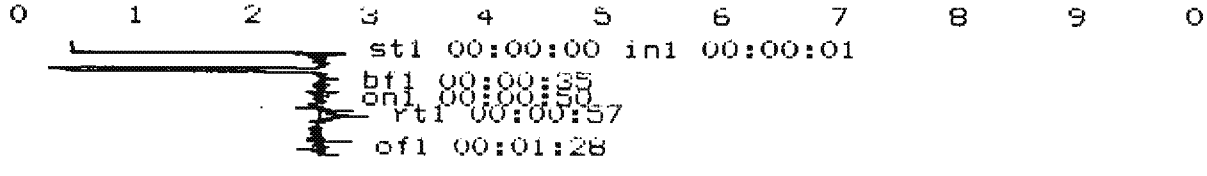
Substance, Time Weighted Average, Time Interval
1 ETO, 2.99 ppm, 00:49:42

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 3.42 ppm, 8



Run number, Inject time, Port name and number, Lows, Highs
1003030348, 10:47:22 AM, Port_09 9, 8, 0

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 4.88 ppm, 8

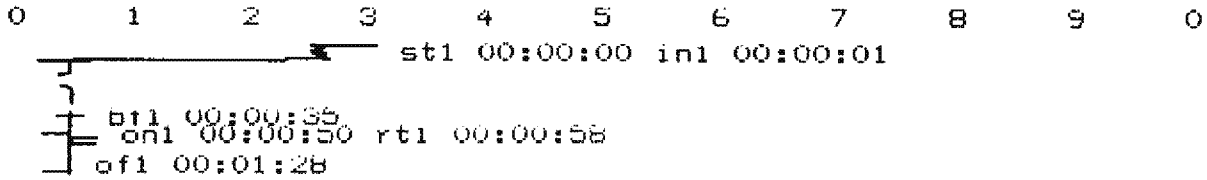


Run number, Inject time, Port name and number, Lows, Highs
1003030342, 10:35:28 AM, Port_09 9, 5, 0

Substance, Samples, Present counts, Concentration
1 ETO, 21, 3252, 0.239 ppm WB II outlet

Substance, Time Weighted Average, Time Interval
1 ETO, 2.77 ppm, 00:39:58

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 4.88 ppm, 8

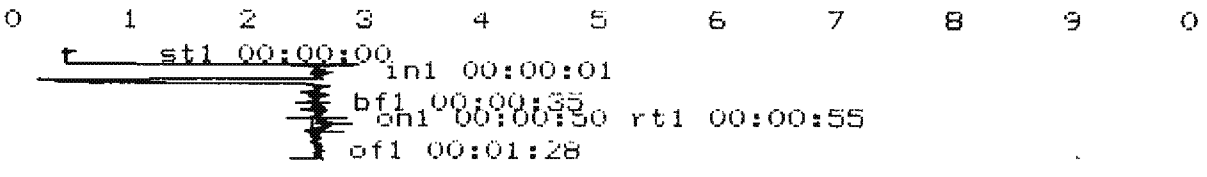


Run number, Inject time, Port name and number, Lows, Highs
1003030343, 10:37:22 AM, Port_09 9, 5, 0

Substance, Samples, Present counts, Concentration
1 ETO, 22, 183, <MDQ

Substance, Time Weighted Average, Time Interval
1 ETO, 2.65 ppm, 00:41:52

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 4.88 ppm, 8

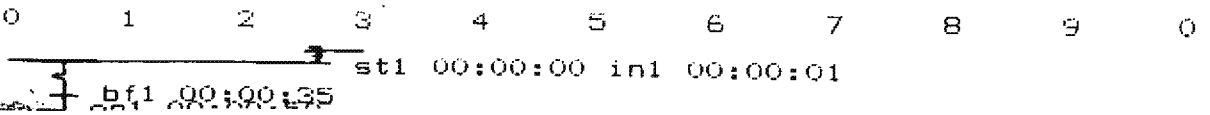


Run number, Inject time, Port name and number, Lows, Highs
1003030344, 10:39:14 AM, Port_09 9, 5, 0

Substance, Samples, Present counts, Concentration
1 ETO, 23, 2636, 0.194 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 2.54 ppm, 00:43:44

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 4.43 ppm, 8

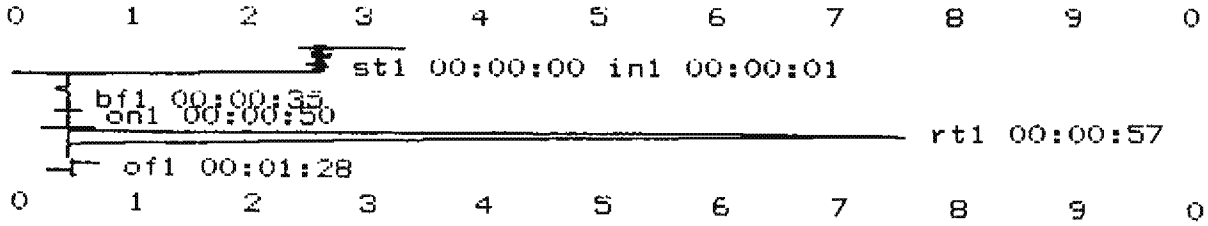


[redacted] Substance, Samples, Present counts, Concentration
1 ETO, 17, 125335, 9.22 ppm

WBI Inlet

Substance, Time Weighted Average, Time Interval
1 ETO, 2.09 ppm, 00:31:36

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 2.01 ppm, 8

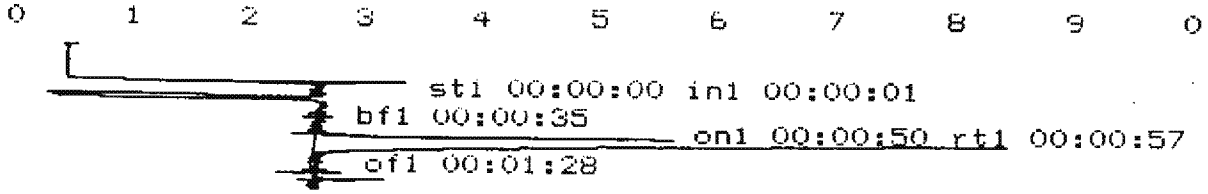


Run number, Inject time, Port name and number, Lows, Highs
1003030339, 10:29:10 AM, Port_09 9, 4, 0

Substance, Samples, Present counts, Concentration
1 ETO, 18, 105455, 7.75 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 2.48 ppm, 00:33:40

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 3.20 ppm, 8

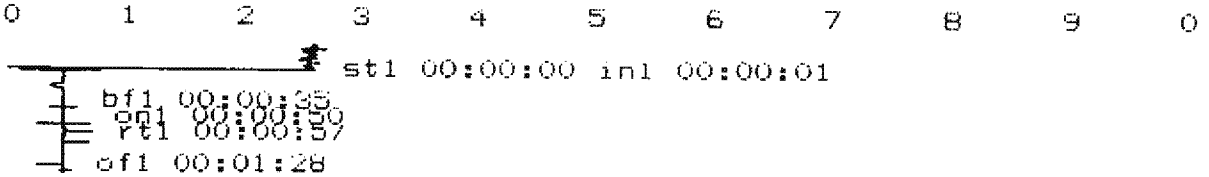


Run number, Inject time, Port name and number, Lows, Highs
1003030340, 10:31:22 AM, Port_09 9, 5, 0

Substance, Samples, Present counts, Concentration
1 ETO, 19, 114644, 8.43 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 2.82 ppm, 00:35:52

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 4.35 ppm, 8



Run number, Inject time, Port name and number, Lows, Highs
1003030341, 10:33:35 AM, Port_09 9, 5, 0

Substance, Samples, Present counts, Concentration
1 ETO, 20, 428, <MDQ

Substance, Time Weighted Average, Time Interval
1 ETO, 2.90 ppm, 00:38:05

0 1 2 3 4 5 6 7 8 9 0

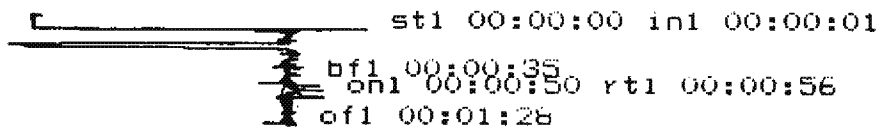
Run number, Inject time, Port name and number, Lows, Highs
1003030335, 10:21:03 AM, Port_09 9, 1, 0

Substance, Samples, Present counts, Concentration
1 ETO, 14, 197, <MDQ

Substance, Time Weighted Average, Time Interval
1 ETO, 1.58 ppm, 00:25:33

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.308 ppm, 8

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

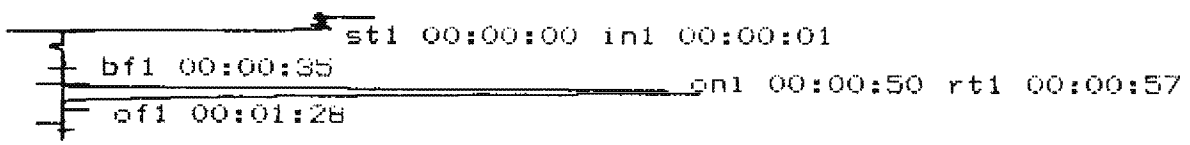
Run number, Inject time, Port name and number, Lows, Highs
1003030336, 10:22:56 AM, Port_09 9, 1, 0

Substance, Samples, Present counts, Concentration
1 ETO, 15, 2272, 0.167 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 1.48 ppm, 00:27:26

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.268 ppm, 8

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

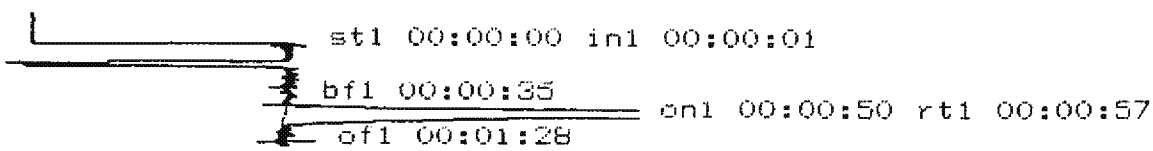
Run number, Inject time, Port name and number, Lows, Highs
1003030337, 10:24:49 AM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 16, 95637, 7.03 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 1.62 ppm, 00:29:19

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.727 ppm, 8

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1003030338, 10:27:06 AM, Port_09 9, 3, 0

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 2.41 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:57
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1003030332, 10:15:19 AM, Port_09 9, 1, 0

Substance, Samples, Present counts, Concentration
1 ETO, 11, 9456, 0.695 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 1.98 ppm, 00:19:49

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 1.91 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:57
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1003030333, 10:17:16 AM, Port_09 9, 1, 0

Substance, Samples, Present counts, Concentration
1 ETO, 12, 766, 0.0563 ppm

NBI outlet

Substance, Time Weighted Average, Time Interval
1 ETO, 1.83 ppm, 00:21:46

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 1.30 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:58
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1003030334, 10:19:09 AM, Port_09 9, 1, 0

Substance, Samples, Present counts, Concentration
1 ETO, 13, 3461, 0.254 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 1.70 ppm, 00:23:39

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.627 ppm, 8

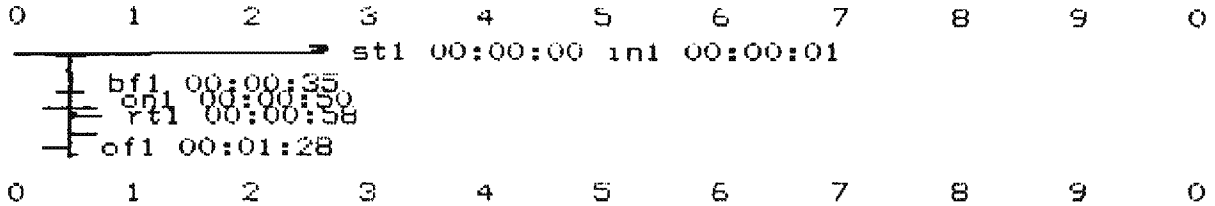
0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01

Substance, Samples, Present counts, Concentration
1 ETO, 7, 9852, 0.724 ppm

Substance, Time weighted Average, Time Interval
1 ETO, 2.98 ppm, 00:12:12

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 2.98 ppm, 7

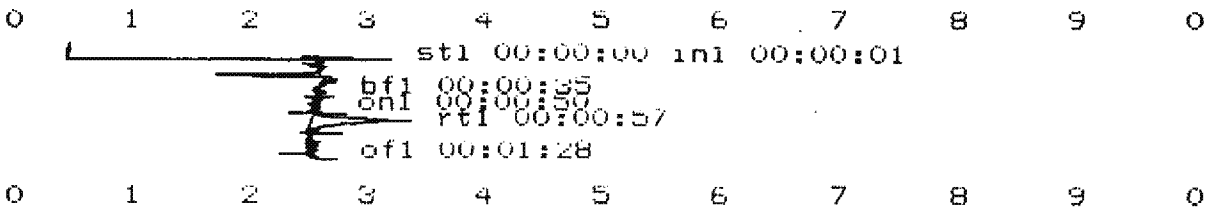


Run number, Inject time, Port name and number, Lows, Highs
1003030329, 10:09:38 AM, Port_09 9, 1, 0

Substance, Samples, Present counts, Concentration
1 ETO, 8, 649, <MDQ

Substance, Time Weighted Average, Time Interval
1 ETO, 2.62 ppm, 00:14:08

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 2.62 ppm, 8

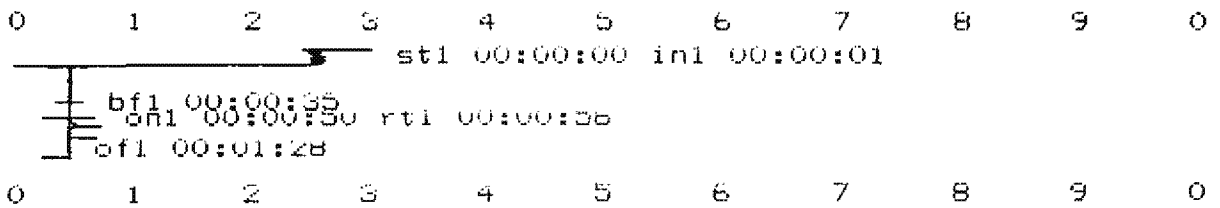


Run number, Inject time, Port name and number, Lows, Highs
1003030330, 10:11:32 AM, Port_09 9, 1, 0

Substance, Samples, Present counts, Concentration
1 ETO, 9, 9804, 0.721 ppm 1.1 PPM

Substance, Time Weighted Average, Time Interval
1 ETO, 2.35 ppm, 00:16:02

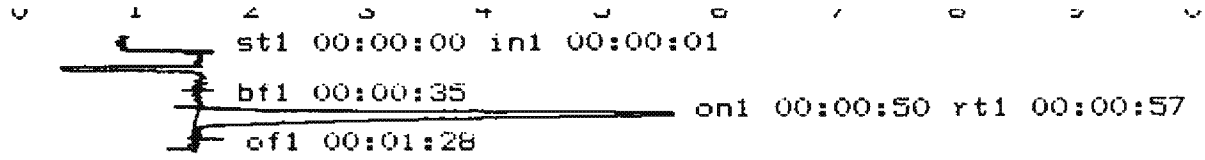
Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 2.65 ppm, 8



Run number, Inject time, Port name and number, Lows, Highs
1003030331, 10:13:27 AM, Port_09 9, 1, 0

Substance, Samples, Present counts, Concentration
1 ETO, 10, 831, 0.0611 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 2.14 ppm, 00:17:57

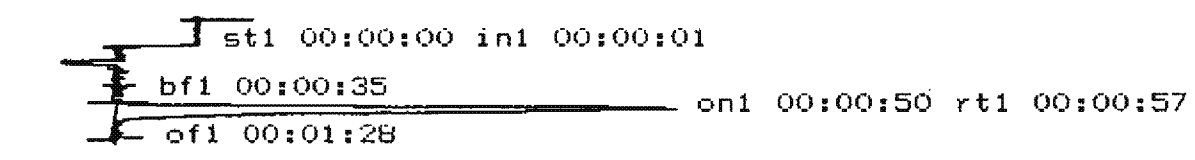


Run number, Inject time, Port name and number, Lows, Highs
1010030574, 05:39:17 PM, Port_09 9, 1, 0

Substance, Samples, Present counts, Concentration
1 ETO, 13, 79319, 12.8 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.271 ppm, 02:27:42

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 1.16 ppm, 8

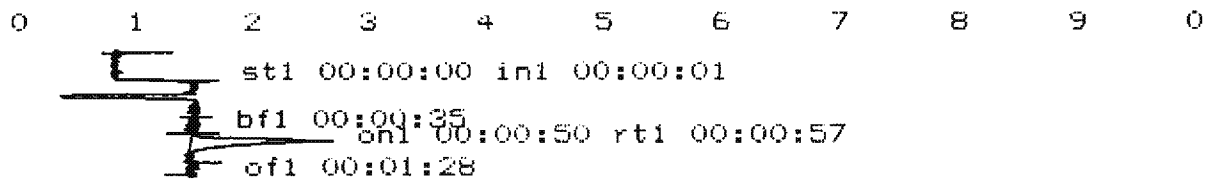


Run number, Inject time, Port name and number, Lows, Highs
1010030575, 05:41:23 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 14, 82345, 13.3 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.450 ppm, 02:29:48

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 3.06 ppm, 8

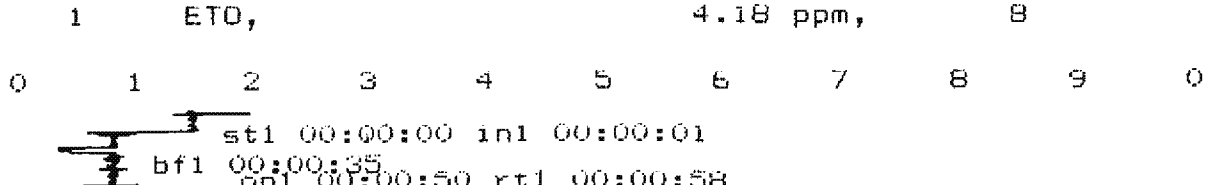


Run number, Inject time, Port name and number, Lows, Highs
1010030576, 05:43:31 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 15, 15917, 2.57 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.555 ppm, 02:31:56

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 4.18 ppm, 8



0 1 2 3 4 5 6 7 8 9 0

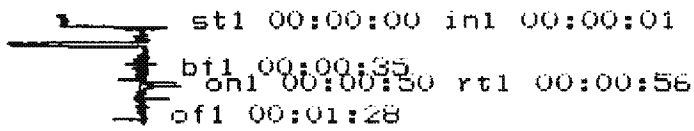
Run number, Inject time, Port name and number, Lows, Highs
1010030567, 05:25:51 PM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 6, 6658, 1.07 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.182 ppm, 02:14:16

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.635 ppm, 3

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

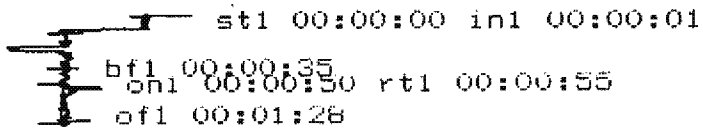
Run number, Inject time, Port name and number, Lows, Highs
1010030568, 05:27:47 PM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 7, 1954, 0.315 ppm - WBI OUT

Substance, Time Weighted Average, Time Interval
1 ETO, 0.189 ppm, 02:16:12

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.648 ppm, 4

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

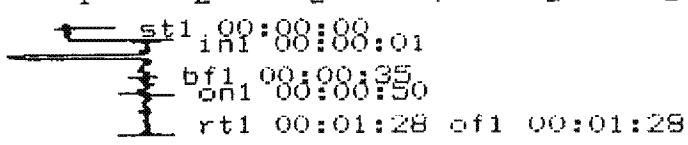
Run number, Inject time, Port name and number, Lows, Highs
1010030569, 05:29:42 PM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 6, 2913, 0.470 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.192 ppm, 02:18:07

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.605 ppm, 5

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1010030570, 05:31:36 PM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration

Run number, Inject time, Port name and number, Lows, Highs
1010030570, 05:31:36 PM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 9, 12, <MDQ w/ II out

Substance, Time Weighted Average, Time Interval
1 ETO, 0.193 ppm, 02:20:01

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.552 ppm, 6

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:01:26
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1010030571, 05:33:30 PM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 10, 187, <MDQ

Substance, Time Weighted Average, Time Interval
1 ETO, 0.190 ppm, 02:21:55

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.465 ppm, 6

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:01:26 of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1010030572, 05:35:25 PM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 11, 328, 0.0530 ppm w/ II AV OUT

Substance, Time Weighted Average, Time Interval
1 ETO, 0.188 ppm, 02:23:50

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.392 ppm, 7

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:57
of1 00:01:26

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1010030573, 05:37:21 PM, Port_09 9, 0, 0

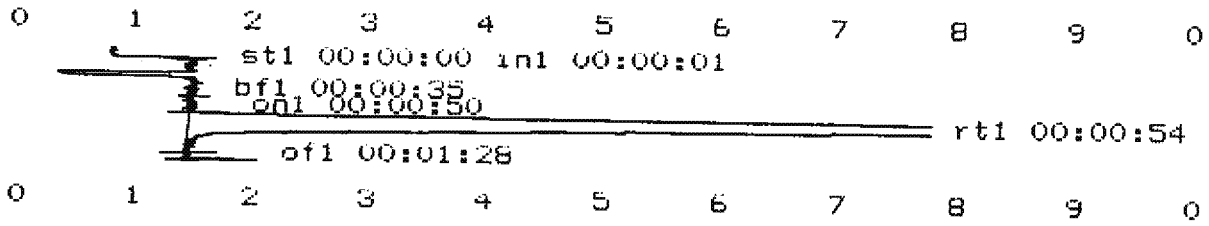
Substance, Samples, Present counts, Concentration
1 ETO, 12, 1789, 0.289 ppm

Run number, Inject time, Port name and number, Lows, Highs
1010030577, 05:45:28 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 16, 15881, 2.56 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.581 ppm, 02:33:53

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 4.50 ppm, 8

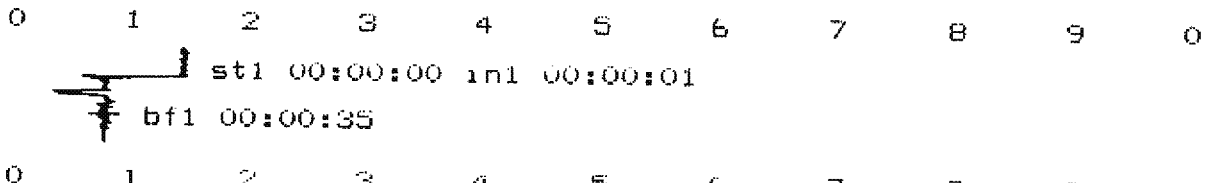


Run number, Inject time, Port name and number, Lows, Highs
1010030578, 05:47:26 PM, Port_09 9, 3, 0

Substance, Samples, Present counts, Concentration
1 ETO, 17, 235630, 38.0 ppm -WB II AV (N

Substance, Time Weighted Average, Time Interval
1 ETO, 0.830 ppm, 02:35:51

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 7.34 ppm, 8



All the alarms were acknowledged at 05:50:58 PM on 10-10-03.

0 1 2 3 4 5 6 7 8 9 0

bf1 00:00:35
on1 00:00:50 rt1 00:00:58
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1010030564, 05:20:05 PM, Port_02 2, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 12, 1178, 0.190 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.303 ppm, 02:06:41

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.190 ppm, 2

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00
in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:57
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1010030565, 05:22:00 PM, Port_10 10, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 2, 7995, 1.29 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 1.32 ppm, 01:10:05

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 1.29 ppm, 1

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:58
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1010030566, 05:23:55 PM, Port_09 9, 0, 0

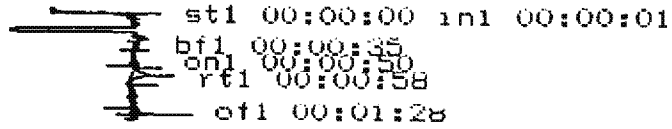
Substance, Samples, Present counts, Concentration
1 ETO, 5, 5589, 0.902 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.170 ppm, 02:12:20

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.515 ppm, 2

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:57



0 1 2 3 4 5 6 7 8 9 0

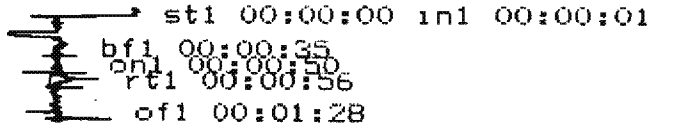
Run number, Inject time, Port name and number, Lows, Highs
1015030408, 12:31:22 PM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 18, 1975, 0.361 ppm WBI outle

Substance, Time Weighted Average, Time Interval
1 ETO, 0.381 ppm, 04:57:03

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.599 ppm, 9

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

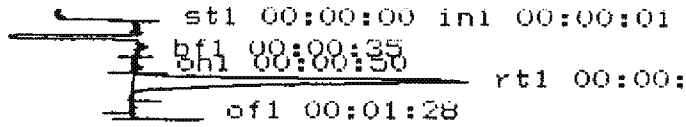
Run number, Inject time, Port name and number, Lows, Highs
1015030409, 12:33:17 PM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 19, 3456, 0.632 ppm

Substance, Time weighted Average, Time Interval
1 ETO, 0.382 ppm, 04:58:58

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.704 ppm, 8

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

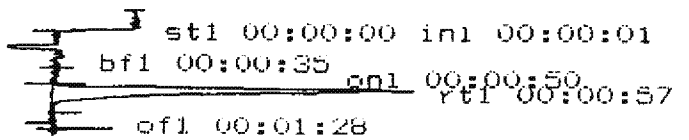
Run number, Inject time, Port name and number, Lows, Highs
1015030410, 12:35:12 PM, Port_09 9, 1, 0

Substance, Samples, Present counts, Concentration
1 ETO, 20, 45457, 8.31 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.408 ppm, 05:00:53

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 1.28 ppm, 8

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

[redacted] Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 21, 47753, 8.73 ppm WBI inlet

Substance, Time Weighted Average, Time Interval
1 ETO, 0.462 ppm, 05:02:54

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 2.44 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:56
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1015030412, 12:39:18 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 22, 634, 0.116 ppm WBII outlet

Substance, Time Weighted Average, Time Interval
1 ETO, 0.489 ppm, 05:04:59

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 2.95 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:01:16
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1015030413, 12:41:13 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 23, 869, 0.159 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.487 ppm, 05:06:54

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 2.85 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

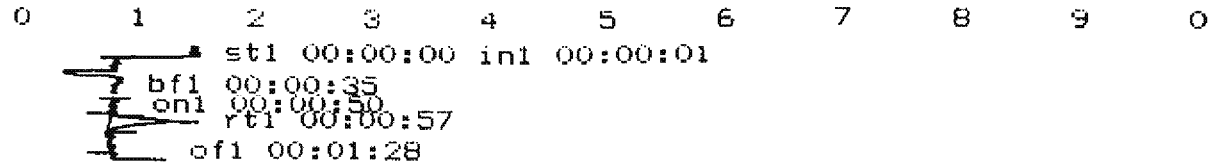
st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:57
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1015030414, 12:43:08 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 24, 598, 0.109 ppm

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 2.75 ppm, 8

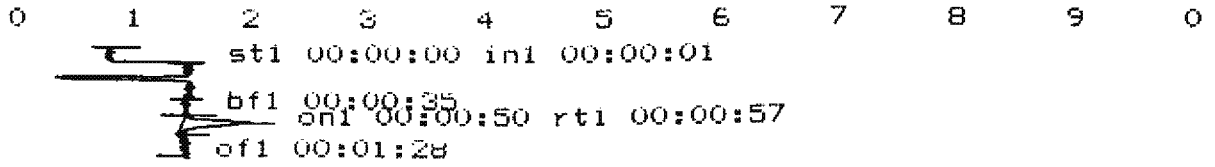


Run number, Inject time, Port name and number, Lows, Highs
1015030415, 12:45:03 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 25, 8100, 1.48 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.487 ppm, 05:10:44

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 2.78 ppm, 8

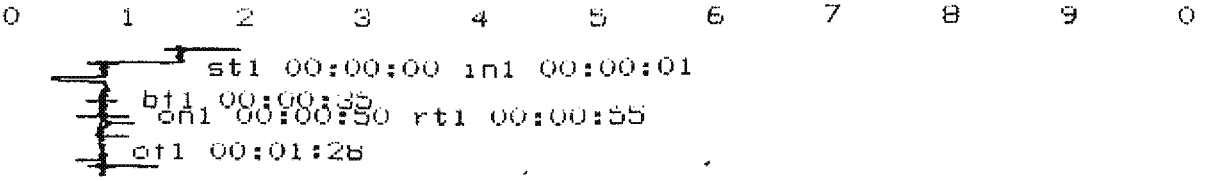


Run number, Inject time, Port name and number, Lows, Highs
1015030416, 12:46:59 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 26, 8310, 1.52 ppm WBII inlet

Substance, Time Weighted Average, Time Interval
1 ETO, 0.493 ppm, 05:12:40

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 2.91 ppm, 8

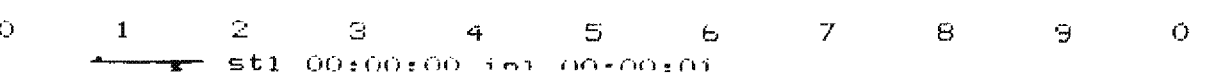


Run number, Inject time, Port name and number, Lows, Highs
1015030417, 12:48:54 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 27, 1332, 0.244 ppm WBII ~~inlet~~ outlet A.F.

Substance, Time Weighted Average, Time Interval
1 ETO, 0.495 ppm, 05:14:35

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 2.41 ppm, 8



of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1015030418, 12:50:50 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 28, 1445, 0.264 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.494 ppm, 05:16:31

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 1.20 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:54
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1015030419, 12:52:45 PM, Port_09 9, 3, 0

Substance, Samples, Present counts, Concentration
1 ETO, 29, 264712, 48.4 ppm WBII Inlet A.F.

Substance, Time Weighted Average, Time Interval
1 ETO, 0.638 ppm, 05:18:26

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 4.00 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:54
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1015030420, 12:54:56 PM, Port_09 9, 4, 0

Substance, Samples, Present counts, Concentration
1 ETO, 30, 258291, 47.2 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.959 ppm, 05:20:37

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 11.5 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:54
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs

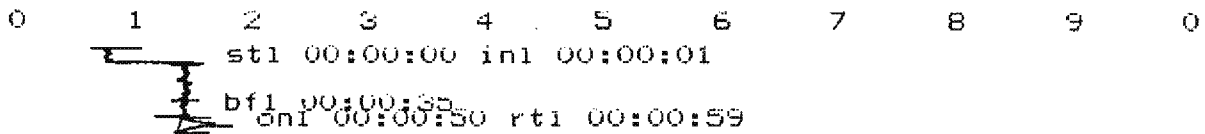
Run number, Inject time, Port name and number, Lows, Highs
1015030405, 12:25:36 PM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 15, 4960, 0.907 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.374 ppm, 04:51:17

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.422 ppm, 7

1.1 PPM

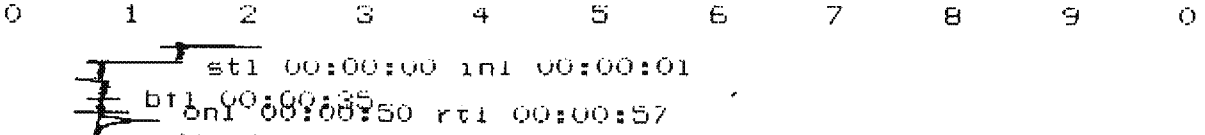


Run number, Inject time, Port name and number, Lows, Highs
1015030406, 12:27:32 PM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 16, 4536, 0.830 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.377 ppm, 04:53:13

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.489 ppm, 8



Run number, Inject time, Port name and number, Lows, Highs
1015030407, 12:29:27 PM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 17, 4730, 0.865 ppm

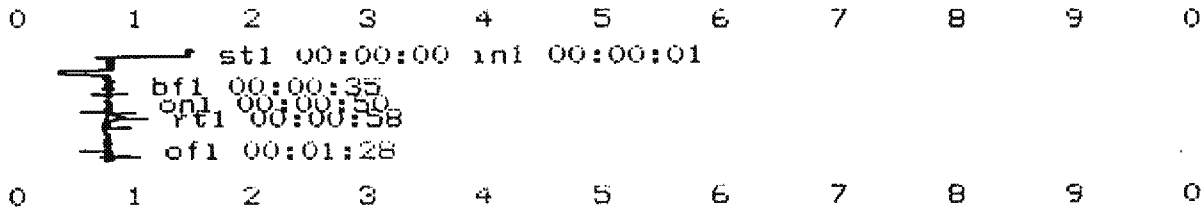
Substance, Time Weighted Average, Time Interval
1 ETO, 0.380 ppm, 04:55:08

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.535 ppm, 9

Substance, Samples, Present counts, Concentration
1 ETO, 13, 9720, 1.63 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.605 ppm, 00:22:21

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.651 ppm, 9

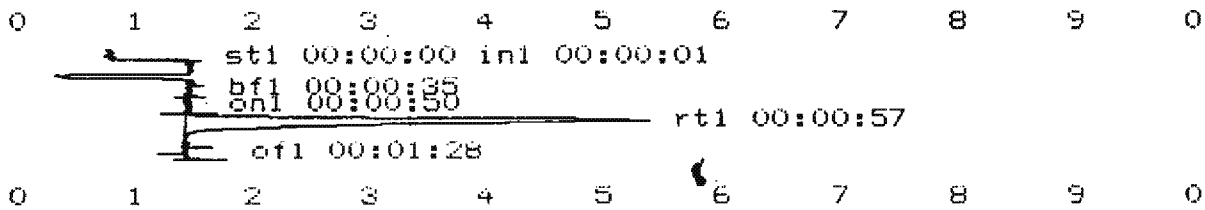


Run number, Inject time, Port name and number, Lows, Highs
1022030503, 03:27:28 PM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 14, 1911, 0.320 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.634 ppm, 00:24:17

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.695 ppm, 8

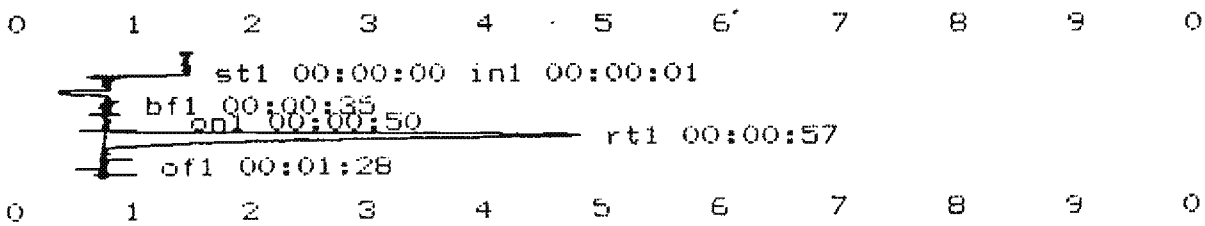


Run number, Inject time, Port name and number, Lows, Highs
1022030504, 03:29:21 PM, Port_09 9, 1, 0

Substance, Samples, Present counts, Concentration
1 ETO, 15, 63807, 10.7 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.985 ppm, 00:26:10

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 1.39 ppm, 8



Run number, Inject time, Port name and number, Lows, Highs
1022030505, 03:31:24 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 16, 68165, 11.4 ppm WBI inlet

Substance, Time Weighted Average, Time Interval
1 ETO, 1.72 ppm, 00:28:13

rt1 00:00:57
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1022030499, 03:19:52 PM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 10, 4562, 0.765 ppm

1.1 PPM

Substance, Time Weighted Average, Time Interval
1 ETO, 0.607 ppm, 00:16:41

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.661 ppm, 9

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:57
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1022030500, 03:21:46 PM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 11, 2201, 0.369 ppm

WBI adlet

Substance, Time Weighted Average, Time Interval
1 ETO, 0.603 ppm, 00:18:35

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.674 ppm, 9

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:56
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1022030501, 03:23:39 PM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 12, 1326, 0.222 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.575 ppm, 00:20:28

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.625 ppm, 9

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:58
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:56
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1022030506, 03:33:26 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 17, 3049, 0.511 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 2.00 ppm, 00:30:15

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 3.72 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:56
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1022030507, 03:35:20 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 18, 1172, 0.196 ppm WBII outlet

Substance, Time Weighted Average, Time Interval
1 ETO, 1.91 ppm, 00:32:09

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 3.69 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:01:16
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1022030508, 03:37:13 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 19, 1286, 0.216 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 1.81 ppm, 00:34:02

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 3.68 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1022030509, 03:39:06 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 20, 8626, 1.45 ppm WB II inlet

Substance, Time Weighted Average, Time Interval
1 ETO, 1.76 ppm, 00:35:55

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 3.66 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:57
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1022030510, 03:41:00 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 21, 8709, 1.46 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 1.74 ppm, 00:37:49

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 3.74 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:56
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1022030511, 03:42:55 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 22, 2165, 0.363 ppm WB II outlet A.F

Substance, Time Weighted Average, Time Interval
1 ETO, 1.70 ppm, 00:39:44

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 3.09 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:53
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1022030512, 03:44:49 PM, Port_09 9, 3, 0

4.47 ppm

W8 II
Inlet
AF

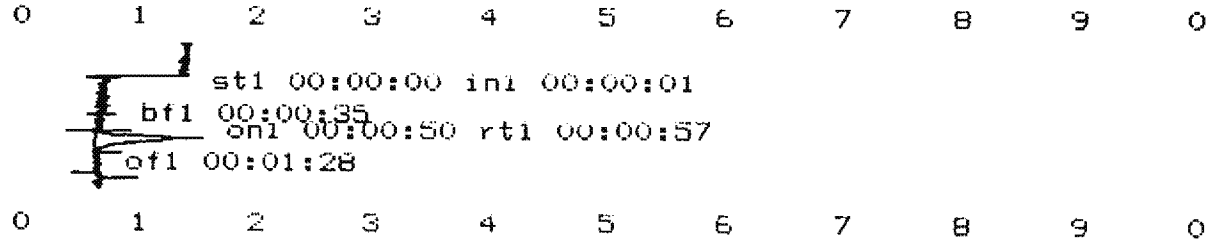
Substance, Time Weighted Average, Time Interval
1 ETO, 2.59 ppm, 00:41:38

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 4.41 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:57
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0



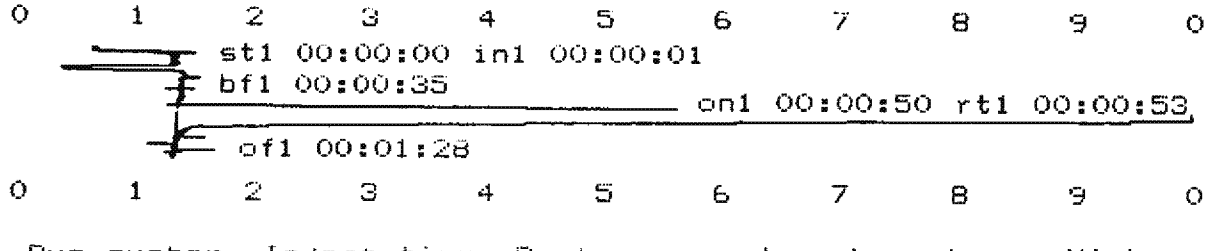
Calibration run 1022030513 at 03:47:01 PM:
This run was a calibration because:
A scheduled calibration time occured.

Substance, Present Counts, Average Counts, Concentration
1 ETO, 11016, 11016, 1.65 ppm

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:53
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

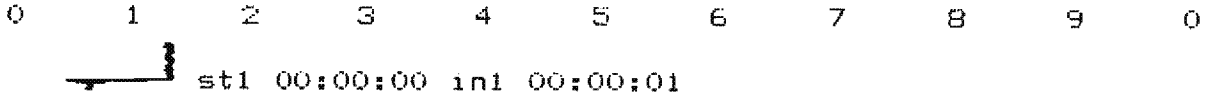


Run number, Inject time, Port name and number, Lows, Highs
1022030514, 03:48:55 PM, Port_09 9, 4, 0

Substance, Samples, Present counts, Concentration
1 ETO, 24, 259767, 38.9 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 5.96 ppm, 00:45:44

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 15.6 ppm, 7

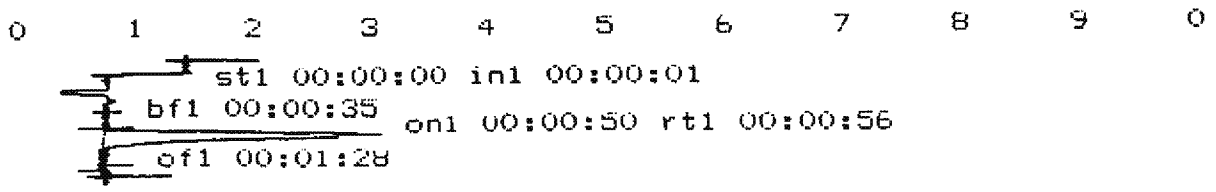


0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01

Substance, Time Weighted Average, Time Interval
1 ETO, 0.234 ppm, 04:35:45

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.609 ppm, 8



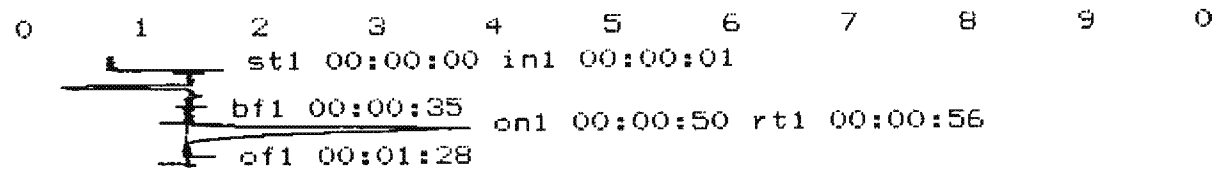
Run number, Inject time, Port name and number, Lows, Highs
1028030380, 11:42:08 AM, Port_09 9, 1, 0

Substance, Samples, Present counts, Concentration
1 ETO, 23, 33575, 6.86 ppm

WBI inlet

Substance, Time Weighted Average, Time Interval
1 ETO, 0.257 ppm, 04:37:40

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 1.00 ppm, 8

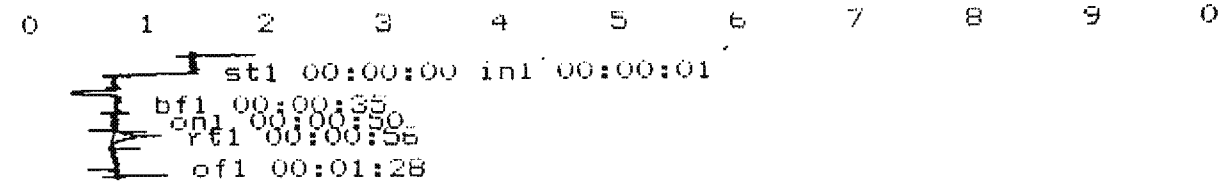


Run number, Inject time, Port name and number, Lows, Highs
1028030381, 11:44:11 AM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 24, 34880, 7.12 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.306 ppm, 04:39:43

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 1.93 ppm, 8



Run number, Inject time, Port name and number, Lows, Highs
1028030382, 11:46:12 AM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 25, 2975, 0.607 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.331 ppm, 04:41:44

Substance, 15 Minute Short Term Exposure, Samples

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1028030376, 11:34:29 AM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 19, 4551, 0.929 ppm 1.1 PPM

Substance, Time Weighted Average, Time Interval
1 ETO, 0.233 ppm, 04:30:01

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.819 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:55
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1028030377, 11:36:24 AM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 20, 905, 0.185 ppm WBI outlet

Substance, Time Weighted Average, Time Interval
1 ETO, 0.235 ppm, 04:31:56

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.779 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:54
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1028030378, 11:38:19 AM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 21, 631, 0.129 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.234 ppm, 04:33:51

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.693 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:56
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

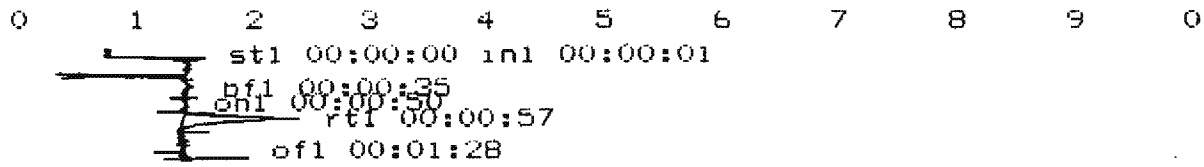
Run number, Inject time, Port name and number, Lows, Highs
1028030379, 11:40:13 AM, Port_09 9, 0, 0

Run number, Inject time, Port name and number, Lows, Highs
1028030386, 11:53:51 AM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 29, 11600, 2.37 ppm WBF inlet

Substance, Time Weighted Average, Time Interval
1 ETO, 0.337 ppm, 04:49:23

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 2.42 ppm, 8

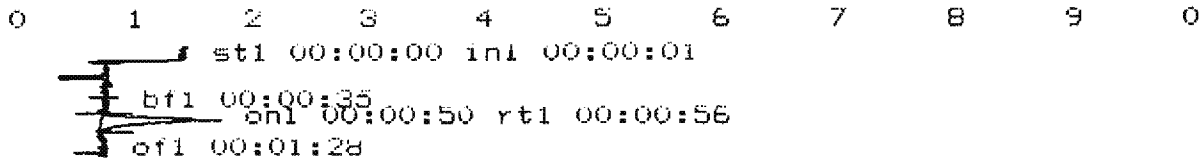


Run number, Inject time, Port name and number, Lows, Highs
1028030387, 11:55:49 AM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 30, 11591, 2.37 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.351 ppm, 04:51:21

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 2.26 ppm, 8

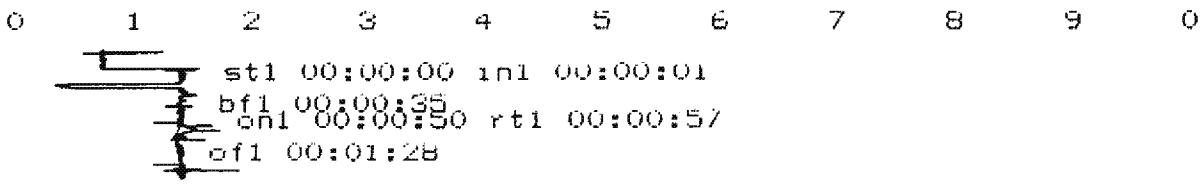


Run number, Inject time, Port name and number, Lows, Highs
1028030388, 11:57:45 AM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 31, 12302, 2.51 ppm

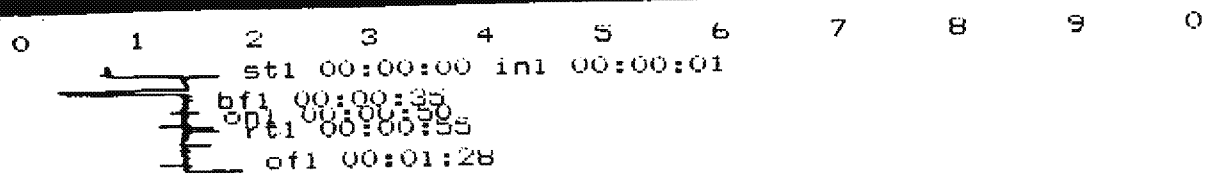
Substance, Time Weighted Average, Time Interval
1 ETO, 0.364 ppm, 04:53:17

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 1.57 ppm, 8



Run number, Inject time, Port name and number, Lows, Highs
1028030389, 11:59:42 AM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 32, 2052, 0.419 ppm



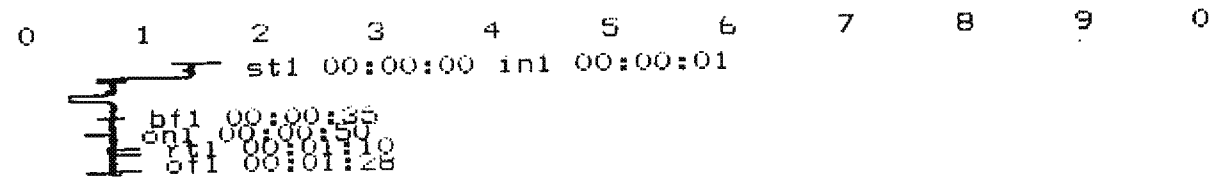
Run number, Inject time, Port name and number, Lows, Highs
1028030383, 11:48:07 AM, Port_09 9, 2, 0

Substance,	Samples,	Present counts,	Concentration
1 ETO,	26,	916,	0.187 ppm

WBF outle

Substance,	Time Weighted Average,	Time Interval
1 ETO,	0.332 ppm,	04:43:39

Substance,	15 Minute Short Term Exposure,	Samples
1 ETO,	2.30 ppm,	8

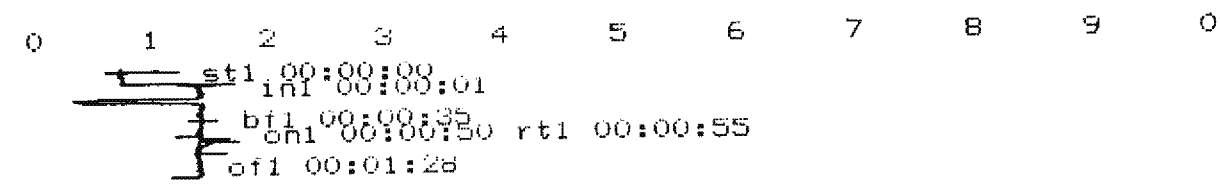


Run number, Inject time, Port name and number, Lows, Highs
1028030384, 11:50:03 AM, Port_09 9, 2, 0

Substance,	Samples,	Present counts,	Concentration
1 ETO,	27,	1183,	0.242 ppm

Substance,	Time Weighted Average,	Time Interval
1 ETO,	0.331 ppm,	04:45:35

Substance,	15 Minute Short Term Exposure,	Samples
1 ETO,	2.25 ppm,	8

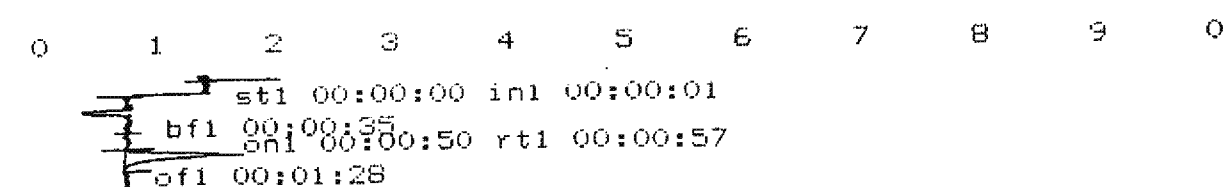


Run number, Inject time, Port name and number, Lows, Highs
1028030385, 11:51:57 AM, Port_09 9, 2, 0

Substance,	Samples,	Present counts,	Concentration
1 ETO,	26,	1224,	0.250 ppm

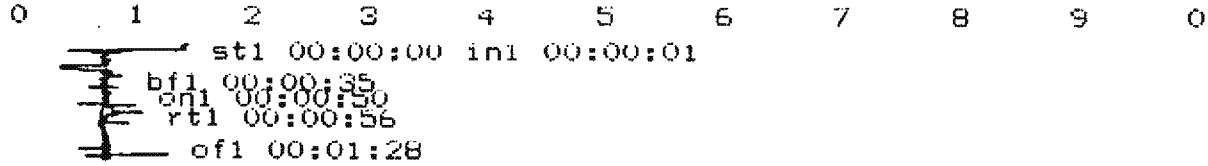
Substance,	Time Weighted Average,	Time Interval
1 ETO,	0.331 ppm,	04:47:29

Substance,	15 Minute Short Term Exposure,	Samples
1 ETO,	2.26 ppm,	8



1 ETO, 0.372 ppm, 04:55:14

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 1.21 ppm, 8

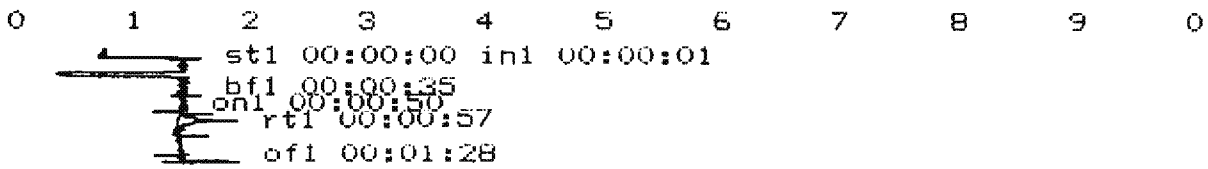


Run number, Inject time, Port name and number, Lows, Highs
1028030390, 12:01:38 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 33, 2143, 0.438 ppm WBII outlet A.F

Substance, Time Weighted Average, Time Interval
1 ETO, 0.372 ppm, 04:57:10

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 1.22 ppm, 8

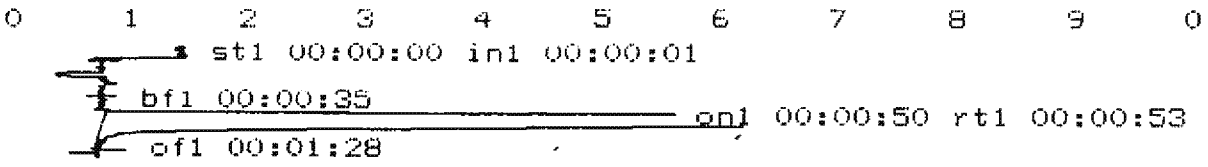


Run number, Inject time, Port name and number, Lows, Highs
1028030391, 12:03:33 PM, Port_09 9, 2, 0

Substance, Samples, Present counts, Concentration
1 ETO, 34, 4222, 0.862 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.374 ppm, 04:59:05

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 1.28 ppm, 8



Run number, Inject time, Port name and number, Lows, Highs
1028030392, 12:05:28 PM, Port_09 9, 2, 1

Substance, Samples, Present counts, Concentration
1 ETO, 35, 276306, 56.4 ppm WBII inlet A.F.

Substance, Time Weighted Average, Time Interval
1 ETO, 0.554 ppm, 05:01:00

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 5.30 ppm, 8

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.649 ppm, 9

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:57
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1106030329, 10:06:59 AM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 16, 5695, 0.848 ppm 1.1 PPM

Substance, Time Weighted Average, Time Interval
1 ETO, 0.253 ppm, 02:54:48

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.772 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:58
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1106030330, 10:08:54 AM, Port_09 9, 0, 0

Substance, Samples, Present counts, Concentration
1 ETO, 17, 2651, 0.395 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.257 ppm, 02:56:43

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.768 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:57
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1106030331, 10:10:49 AM, Port_09 9, 0, 0

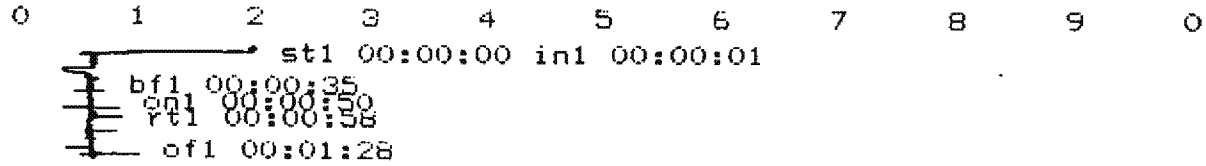
Substance, Samples, Present counts, Concentration
1 ETO, 18, 1847, 0.275 ppm WBI outlet

Substance, Time Weighted Average, Time Interval
1 ETO, 0.258 ppm, 02:58:38

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 0.720 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35

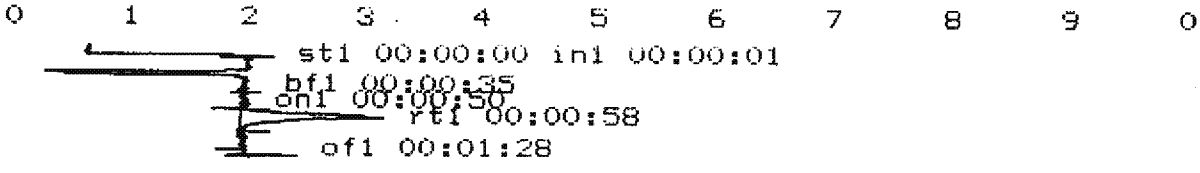


Run number, Inject time, Port name and number, Lows, Highs
1106030339, 10:26:37 AM, Port_09 9, 3, 0

Substance, Samples, Present counts, Concentration
1 ETO, 26, 977, 0.146 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.510 ppm, 03:14:26

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 3.78 ppm, 8

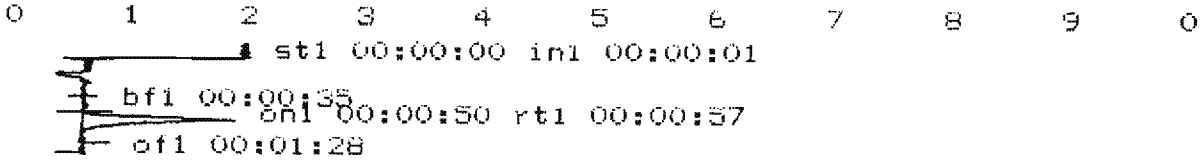


Run number, Inject time, Port name and number, Lows, Highs
1106030340, 10:28:33 AM, Port_09 9, 3, 0

Substance, Samples, Present counts, Concentration
1 ETO, 27, 17880, 2.66 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.519 ppm, 03:16:22

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 3.75 ppm, 8



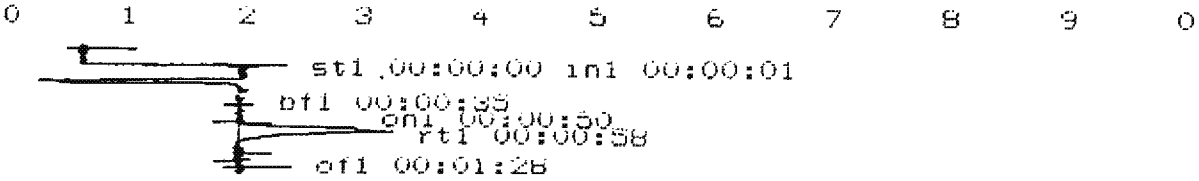
Run number, Inject time, Port name and number, Lows, Highs
1106030341, 10:30:30 AM, Port_09 9, 3, 0

Substance, Samples, Present counts, Concentration
1 ETO, 28, 17931, 2.67 ppm

WB II inlet

Substance, Time Weighted Average, Time Interval
1 ETO, 0.540 ppm, 03:18:19

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 3.42 ppm, 8

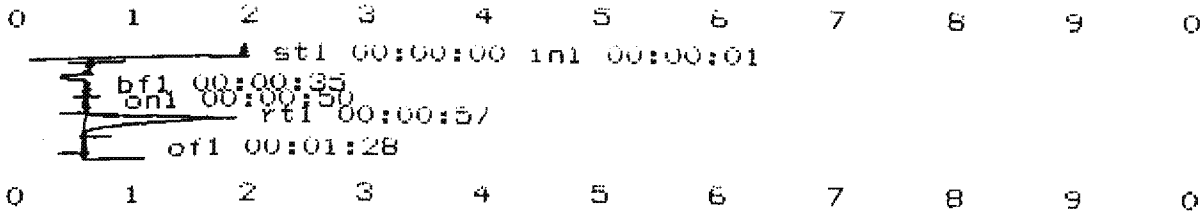


Run number, Inject time, Port name and number, Lows, Highs
1106030342, 10:32:27 AM, Port_09 9, 3, 0

Substance, Samples, Present counts, Concentration
1 ETO, 29, 18232, 2.72 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.561 ppm, 03:20:16

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 2.76 ppm, 8

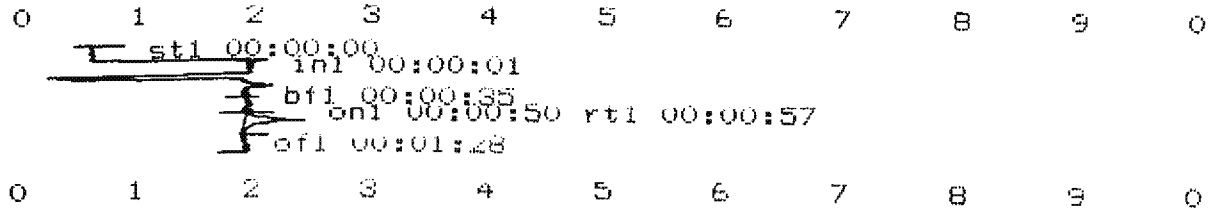


Run number, Inject time, Port name and number, Lows, Highs
1106030343, 10:34:27 AM, Port_09 9, 3, 0

Substance, Samples, Present counts, Concentration
1 ETO, 30, 18077, 2.69 ppm

Substance, Time Weighted Average, Time Interval
1 ETO, 0.582 ppm, 03:22:16

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 2.06 ppm, 8

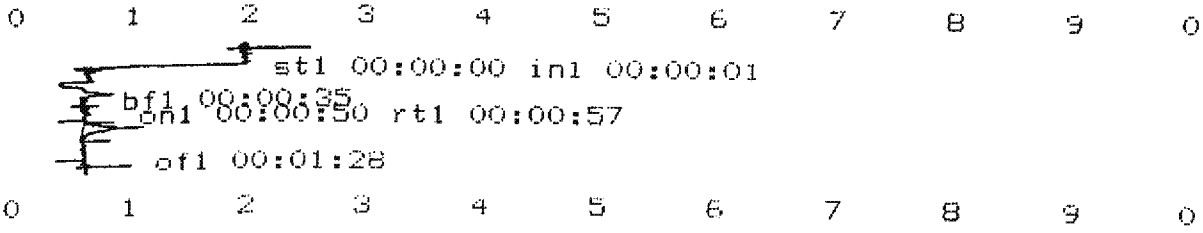


Run number, Inject time, Port name and number, Lows, Highs
1106030344, 10:36:24 AM, Port_09 9, 3, 0

Substance, Samples, Present counts, Concentration
1 ETO, 31, 5186, 0.773 ppm WB II outlet

Substance, Time Weighted Average, Time Interval
1 ETO, 0.593 ppm, 03:24:13 A.F.

Substance, 15 Minute Short Term Exposure, Samples
1 ETO, 1.70 ppm, 8



Run number, Inject time, Port name and number, Lows, Highs
1106030345, 10:38:20 AM, Port_09 9, 3, 0

Substance, Samples, Present counts, Concentration

bf1 00:00:35
on1 00:00:50
rt1 00:01:00
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1113030034, 01:42:03 PM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 7, 5457, 0.826 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.484 ppm, 00:29:31

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.761 ppm, 5

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:01:00
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1113030035, 01:43:58 PM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 8, 7024, 1.06 ppm — 1.1

Substance, Time Weighted Average, Time Interval
1 eto, 0.512 ppm, 00:31:26

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.799 ppm, 6

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01

0 1 2 3 4 5 6 7 8 9 0

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:01:00
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1113030042, 01:56:52 PM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 15, 2124, 0.322 ppm WB 1 out

Substance, Time Weighted Average, Time Interval
1 eto, 0.589 ppm, 00:44:20

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.797 ppm, 9

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1113030047, 02:06:04 PM, none 9, 2, 0

Substance, Samples, Present counts, Concentration
1 eto, 20, 79266, 12.0 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 1.13 ppm, 00:53:32

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 2.59 ppm, 9

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:01:00
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1113030048, 02:07:58 PM, none 9, 3, 0

Substance, Samples, Present counts, Concentration
1 eto, 21, 80034, 12.1 ppm — WB1 IN

Substance, Time Weighted Average, Time Interval
1 eto, 1.50 ppm, 00:55:26

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 4.03 ppm, 9

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01

0 1 2 3 4 5 6 7 8 9 0

0 1 2 3 4 5 6 7 8 9 0

bf1 00:00:35
on1 00:00:50
rt1 00:01:01
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1113030054, 02:19:18 PM, none 9, 5, 0

Substance, Samples, Present counts, Concentration
1 eto, 27, 1535, 0.232 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 2.21 ppm, 01:06:46 WB II OUT

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 6.59 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35

0 1 2 3 4 5 6 7 8 9 0

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 6.59 ppm, 8

0 1 2 3 4 5 6 7 8 9 0
st1 00:00:00 in1 00:00:01
bf1 00:00:35

0 1 2 3 4 5 6 7 8 9 0

0 1 2 3 4 5 6 7 8 9 0
on1 00:00:50 rt1 00:01:01
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1113030060, 02:30:22 PM, none 9, 5, 0

Substance, Samples, Present counts, Concentration
1 eto, 33, 22404, 3.39 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 2.19 ppm, 01:17:50

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 1.63 ppm, 9

0 1 2 3 4 5 6 7 8 9 0
st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:01:00
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1113030061, 02:32:21 PM, none 9, 5, 0

Substance, Samples, Present counts, Concentration
1 eto, 34, 22651, 3.43 ppm WB II INLET

Substance, Time Weighted Average, Time Interval
1 eto, 2.22 ppm, 01:19:49

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 2.02 ppm, 9

0 1 2 3 4 5 6 7 8 9 0
st1 00:00:00 in1 00:00:01

bf1 00:00:35

0 1 2 3 4 5 6 7 8 9 0

This version 6.40-L Monitoring Mode Status Report

was printed on 11-13-03 at 02:38:39 PM.

Serial number 0255

sterigenis
7775quincy
willowbrook

Substance, Time Weighted Average, Time Interval
1 eto, 2.19 ppm, 01:29:38

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 2.34 ppm, 7

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35

0 1 2 3 4 5 6 7 8 9 0

0 1 2 3 4 5 6 7 8 9 0

bf1 00:00:35
on1 00:00:50
rt1 00:00:57
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1113030072, 02:53:12 PM, none 9, 9, 0

Substance, Samples, Present counts, Concentration
1 eto, 44, 267063, 40.4 ppm NOT IN

Substance, Time Weighted Average, Time Interval AFTER VAC
1 eto, 4.43 ppm, 01:40:40

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 22.7 ppm, 7

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01

0 1 2 3 4 5 6 7 8 9 0

The current port sequence and location within the sequence is:

01, 02, 03, 07, 04, 05, 02, 03, 07, 08,
06, 02, 07, 03, 08, 09, 02, 10, 03, 11,
07, 08, 09, 02, 11, 03, 07, 08,12,13,
02, 03, 07, 14, 15, 08, 15, 16,

The manual interrupt port list is:

None programmed.

Time weighted average reports are scheduled at:

07:00 AM 03:00 PM 11:00 PM

1 report(s) will be printed at each time.

Gas chromatograph plots are scheduled at:

07:05 AM 03:05 PM 11:05 PM

2 run(s) will be plotted at each time.

Automatic calibrations are scheduled at:

07:05 AM 03:05 PM 11:05 PM

1 calibration(s) will be performed at each time.

The audible alarm (beep) is off.

The gas chromatograph plotter is off

```
0     1     2     3     4     5     6     7     8     9     0
            on1 00:00:50 rt1 00:01:02
            of1 00:01:28
0     1     2     3     4     5     6     7     8     9     0
```

Run number, Inject time, Port name and number, Lows, Highs
1113030065, 02:40:13 PM, eastwor 8, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 4, 4704, 0.712 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.524 ppm, 01:38:42

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.712 ppm, 1

```
0     1     2     3     4     5     6     7     8     9     0
            st1 00:00:00 in1 00:00:01
      bf1 00:00:35
      on1 00:00:50
      rt1 00:01:02
      of1 00:01:28
0     1     2     3     4     5     6     7     8     9     0
```

Run number, Inject time, Port name and number, Lows, Highs
1113030066, 02:42:10 PM, none 9, 5, 0

Substance, Samples, Present counts, Concentration
1 eto, 38, 3949, 0.598 ppm WB# OUT VAC.

```
bf1 00:00:35
on1 00:00:50
rt1 00:01:00
of1 00:01:28

0     1     2     3     4     5     6     7     8     9     0

Run number, Inject time, Port name and number, Lows, Highs
1113030034, 01:42:03 PM,              none    9,    0,     0

  Substance, Samples, Present counts, Concentration
  1     eto,       7,            5457,      0.826 ppm

  Substance, Time Weighted Average, Time Interval
  1     eto,              0.484 ppm,       00:29:31

  Substance, 15 Minute Short Term Exposure, Samples
  1     eto,                      0.761 ppm,       5

0     1     2     3     4     5     6     7     8     9     0
      st1 00:00:00 in1 00:00:01
      bf1 00:00:35
      on1 00:00:50
      rt1 00:01:00
      of1 00:01:28

0     1     2     3     4     5     6     7     8     9     0

Run number, Inject time, Port name and number, Lows, Highs
1113030035, 01:43:58 PM,              none    9,    0,     0

  Substance, Samples, Present counts, Concentration
  1     eto,       8,            7024,      1.06 ppm

  Substance, Time Weighted Average, Time Interval
  1     eto,              0.512 ppm,       00:31:26

  Substance, 15 Minute Short Term Exposure, Samples
  1     eto,                      0.799 ppm,       6

0     1     2     3     4     5     6     7     8     9     0
      st1 00:00:00 in1 00:00:01

0     1     2     3     4     5     6     7     8     9     0

0     1     2     3     4     5     6     7     8     9     0
      st1 00:00:00 in1 00:00:01
      bf1 00:00:35
      on1 00:00:50 rt1 00:01:00
      of1 00:01:28

0     1     2     3     4     5     6     7     8     9     0

Run number, Inject time, Port name and number, Lows, Highs
1113030042, 01:56:52 PM,              none    9,    0,     0
```

1.1

of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1120030419, 12:54:39 PM, none 9, 1, 0

Substance, Samples, Present counts, Concentration
1 eto, 32, 43727, 8.84 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.215 ppm, 05:15:07

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 1.03 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:01:00
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1120030420, 12:56:45 PM, none 9, 2, 0

Substance, Samples, Present counts, Concentration
1 eto, 33, 45216, 9.14 ppm w BI inlet

Substance, Time Weighted Average, Time Interval
1 eto, 0.273 ppm, 05:17:13

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 2.32 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:01:00
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1120030421, 12:58:48 PM, none 9, 2, 0

Substance, Samples, Present counts, Concentration
1 eto, 34, 4107, 0.831 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.303 ppm, 05:19:16

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 2.96 ppm, 8

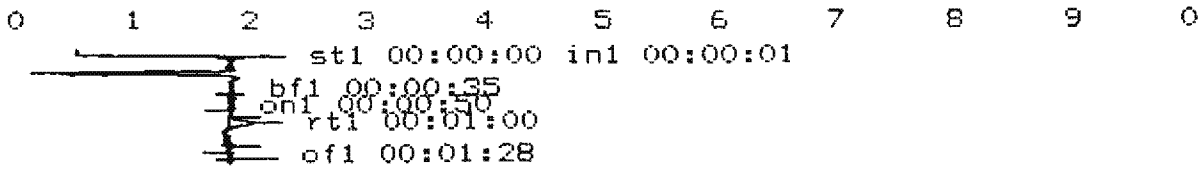
0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:01:00
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1120030422, 01:00:44 PM, none 9, 2, 0

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.590 ppm, 6

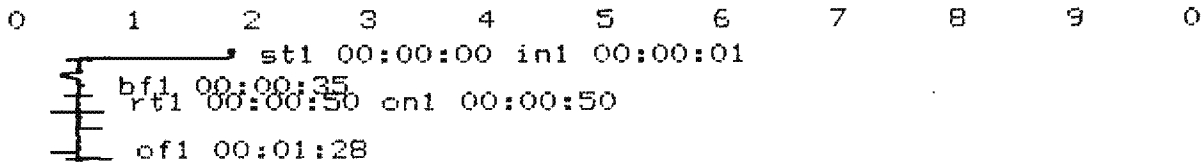


Run number, Inject time, Port name and number, Lows, Highs
1120030416, 12:48:54 PM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 29, 3104, 0.628 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.188 ppm, 05:09:22

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.581 ppm, 7

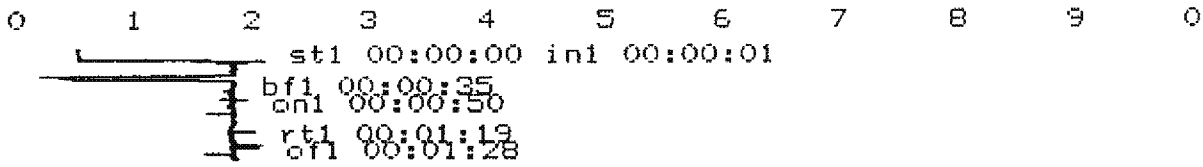


Run number, Inject time, Port name and number, Lows, Highs
1120030417, 12:50:49 PM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 30, 109, <MDQ WBI outlet

Substance, Time Weighted Average, Time Interval
1 eto, 0.189 ppm, 05:11:17

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.542 ppm, 8

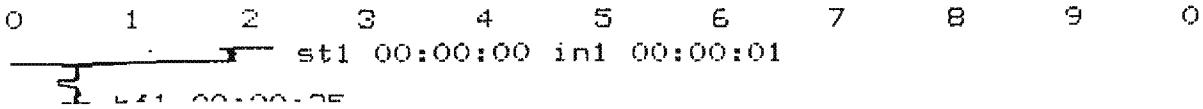


Run number, Inject time, Port name and number, Lows, Highs
1120030418, 12:52:44 PM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 31, 642, 0.130 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.188 ppm, 05:13:12

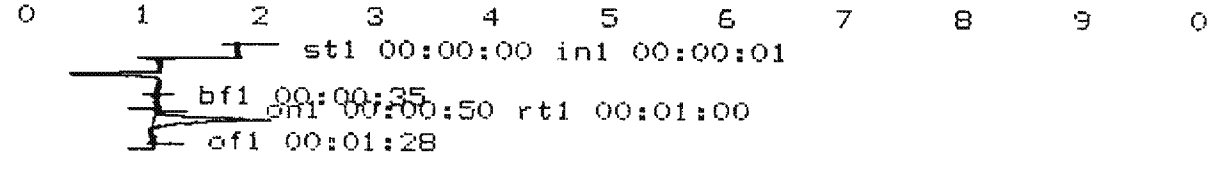
Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.469 ppm, 8



Substance, Samples, Present counts, Concentration
1 eto, 35, 4063, 0.822 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.306 ppm, 05:21:12

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 2.99 ppm, 8

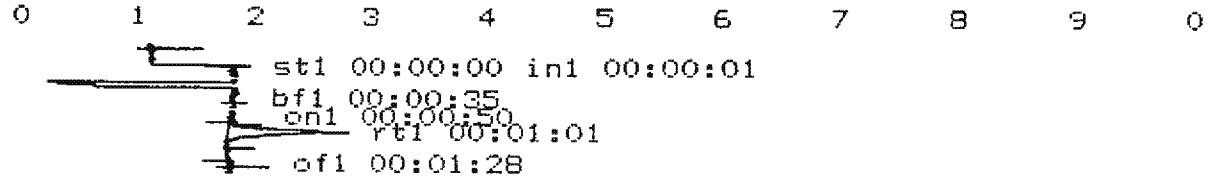


Run number, Inject time, Port name and number, Lows, Highs
1120030423, 01:02:38 PM, none 9, 2, 0

Substance, Samples, Present counts, Concentration
1 eto, 36, 12267, 2.48 ppm WBH inlet

Substance, Time Weighted Average, Time Interval
1 eto, 0.314 ppm, 05:23:06

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 3.14 ppm, 8

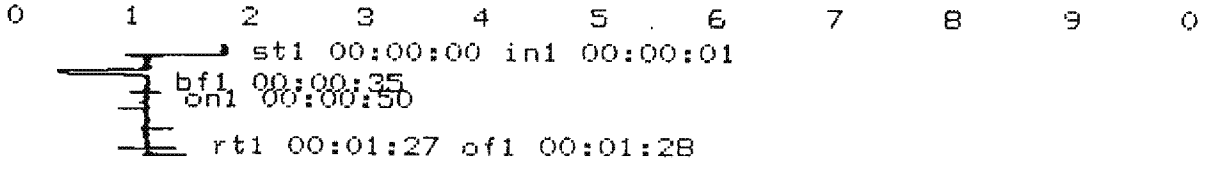


Run number, Inject time, Port name and number, Lows, Highs
1120030424, 01:04:35 PM, none 9, 2, 0

Substance, Samples, Present counts, Concentration
1 eto, 37, 12660, 2.56 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.327 ppm, 05:25:03

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 3.45 ppm, 8



Run number, Inject time, Port name and number, Lows, Highs
1120030425, 01:06:32 PM, none 9, 2, 0

Substance, Samples, Present counts, Concentration
1 eto, 38, 559, 0.113 ppm WBH outlet

Substance, Time Weighted Average, Time Interval
1 eto, 0.333 ppm, 05:27:00

1 eto, 0.497 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:01:00
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1124030397, 12:13:09 PM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 32, 3410, 0.775 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.188 ppm, 05:03:11

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.593 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:59
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1124030398, 12:15:03 PM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 33, 1159, 0.263 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.190 ppm, 05:05:05

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.646 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:58
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1124030399, 12:16:58 PM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 34, 1215, 0.276 ppm WBF out

Substance, Time Weighted Average, Time Interval
1 eto, 0.190 ppm, 05:07:00

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.640 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50

```
0     1     2     3     4     5     6     7     8     9     0
      on1 00:00:50
      rt1 00:01:00
      of1 00:01:28

0     1     2     3     4     5     6     7     8     9     0

 Run number, Inject time, Port name and number, Lows, Highs
 1124030394, 12:07:20 PM,              none    9,    0,     0

   Substance, Samples, Present counts, Concentration
   1     eto,      29,            1770,     0.402 ppm

   Substance, Time Weighted Average, Time Interval
   1     eto,              0.176 ppm,      04:57:22

   Substance, 15 Minute Short Term Exposure, Samples
   1     eto,                      0.309 ppm,       9

0     1     2     3     4     5     6     7     8     9     0
            st1 00:00:00 in1 00:00:01
            bf1 00:00:35
            on1 00:00:50
            rt1 00:01:00
            of1 00:01:28

0     1     2     3     4     5     6     7     8     9     0

 Run number, Inject time, Port name and number, Lows, Highs
 1124030395, 12:09:17 PM,              none    9,    0,     0

   Substance, Samples, Present counts, Concentration
   1     eto,      30,            3829,     0.870 ppm

   Substance, Time Weighted Average, Time Interval
   1     eto,              0.179 ppm,      04:59:19

   Substance, 15 Minute Short Term Exposure, Samples
   1     eto,                      0.374 ppm,       9

0     1     2     3     4     5     6     7     8     9     0
            st1 00:00:00 in1 00:00:01
            bf1 00:00:35
            on1 00:00:50 rt1 00:01:01
            of1 00:01:28

0     1     2     3     4     5     6     7     8     9     0

 Run number, Inject time, Port name and number, Lows, Highs
 1124030396, 12:11:13 PM,              none    9,    0,     0

   Substance, Samples, Present counts, Concentration
   1     eto,      31,            3942,     0.896 ppm

   Substance, Time Weighted Average, Time Interval
   1     eto,              0.184 ppm,      05:01:15
```

1.1 PPM

1205030345, 10:36:18 AM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 15, 1830, 0.360 ppm

WB I outlet

Substance, Time Weighted Average, Time Interval
1 eto, 0.276 ppm, 03:13:49

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.922 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:58
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1205030346, 10:38:13 AM, none 9, 1, 0

Substance, Samples, Present counts, Concentration
1 eto, 16, 74316, 14.6 ppm

WB ~~II~~ I inlet

Substance, Time Weighted Average, Time Interval
1 eto, 0.346 ppm, 03:15:44

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 1.87 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:58
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1205030347, 10:40:18 AM, none 9, 2, 0

Substance, Samples, Present counts, Concentration
1 eto, 17, 77921, 15.3 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.500 ppm, 03:17:49

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 4.01 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:01:03
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1205030348, 10:42:24 AM, none 9, 2, 0

Substance, Samples, Present counts, Concentration
1 eto, 18, 2176, 0.428 ppm

WB II outlet

1 eto, 0.578 ppm, 03:19:33

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 5.03 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:01:22
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1205030349, 10:44:19 AM, none 9, 2, 0

Substance, Samples, Present counts, Concentration
1 eto, 19, 1194, 0.235 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.576 ppm, 03:21:50

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 4.94 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:58
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1205030350, 10:46:13 AM, none 9, 2, 0

Substance, Samples, Present counts, Concentration
1 eto, 20, 8605, 1.69 ppm WB II inlet

Substance, Time Weighted Average, Time Interval
1 eto, 0.579 ppm, 03:23:44

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 4.93 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:59
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1205030351, 10:48:09 AM, none 9, 2, 0

Substance, Samples, Present counts, Concentration
1 eto, 21, 9205, 1.81 ppm WB II outlet A.F.

Substance, Time Weighted Average, Time Interval
1 eto, 0.590 ppm, 03:25:40

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 5.03 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

1205030355, 10:56:21 AM, none 9, 2, 2

Substance, Samples, Present counts, Concentration
1 eto, 25, 292585, 57.5 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 1.52 ppm, 03:33:52

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 15.0 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:54
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1205030356, 10:58:44 AM, none 9, 2, 3

Substance, Samples, Present counts, Concentration
1 eto, 26, 309959, 61.0 ppm

w/ II inlet A.F.

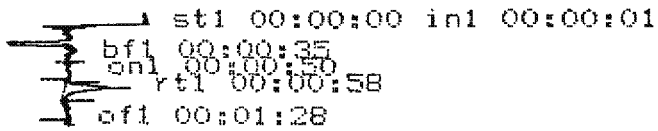
Substance, Time Weighted Average, Time Interval
1 eto, 2.15 ppm, 03:36:15

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 24.3 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00
in1 00:00:01
bf1 00:00:35

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1205030342, 10:30:32 AM, none 9, 0, 0

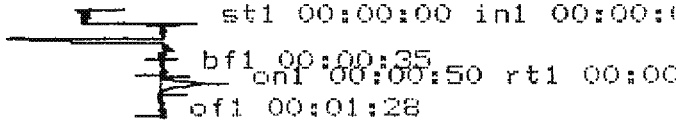
Substance, Samples, Present counts, Concentration
1 eto, 12, 5412, 1.06 ppm

1.1 PPM

Substance, Time Weighted Average, Time Interval
1 eto, 0.256 ppm, 03:08:03

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.847 ppm, 6

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

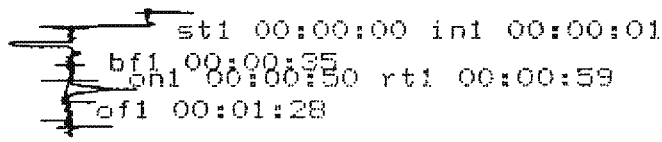
Run number, Inject time, Port name and number, Lows, Highs
1205030343, 10:32:27 AM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 13, 5076, 0.998 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.264 ppm, 03:09:58

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.878 ppm, 7

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

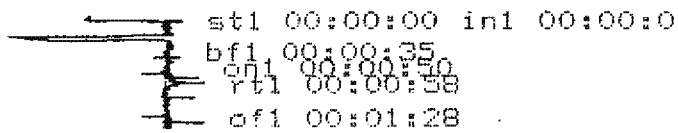
Run number, Inject time, Port name and number, Lows, Highs
1205030344, 10:34:22 AM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 14, 5457, 1.07 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.271 ppm, 03:11:53

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.901 ppm, 8

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

```
0     1     2     3     4     5     6     7     8     9     0
      bf1 00:00:35
        on1 00:00:50 rt1 00:00:59
      of1 00:01:28
0     1     2     3     4     5     6     7     8     9     0

 Run number, Inject time, Port name and number, Lows, Highs
 1210030453, 01:54:54 PM,              none    9,    0,     0

   Substance, Samples, Present counts, Concentration
   1     eto,      16,            4135,     0.880 ppm

   Substance, Time Weighted Average, Time Interval
   1     eto,              0.255 ppm,      06:21:46

   Substance, 15 Minute Short Term Exposure, Samples
   1     eto,                      0.836 ppm,       4

0     1     2     3     4     5     6     7     8     9     0
        st1 00:00:00 in1 00:00:01
      bf1 00:00:35
        on1 00:00:50 rt1 00:00:59
      of1 00:01:28
0     1     2     3     4     5     6     7     8     9     0

 Run number, Inject time, Port name and number, Lows, Highs
 1210030454, 01:56:48 PM,              none    9,    0,     0

   Substance, Samples, Present counts, Concentration
   1     eto,      17,            4443,     0.946 ppm
```

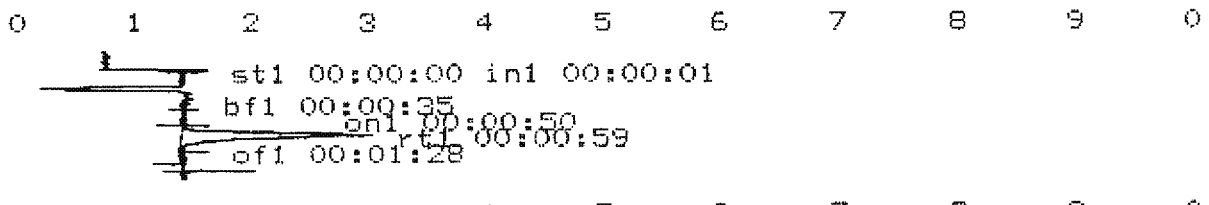
1.1PM

```
   Substance, Time Weighted Average, Time Interval
   1     eto,              0.259 ppm,      06:23:40

   Substance, 15 Minute Short Term Exposure, Samples
   1     eto,                      0.856 ppm,       5

0     1     2     3     4     5     6     7     8     9     0
        st1 00:00:00 in1 00:00:01
      bf1 00:00:35
        on1 00:00:50 rt1 00:00:59
      of1 00:01:28
0     1     2     3     4     5     6     7     8     9     0

 Run number, Inject time, Port name and number, Lows, Highs
 1210030455, 01:58:43 PM,              none    9,    0,     0

   Substance, Samples, Present counts, Concentration
   1     eto,      18,            2789,     0.594 ppm
```

WBI called

```
   Substance, Time Weighted Average, Time Interval
   1     eto,              0.261 ppm,      06:25:35
```

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 29.4 ppm, 8

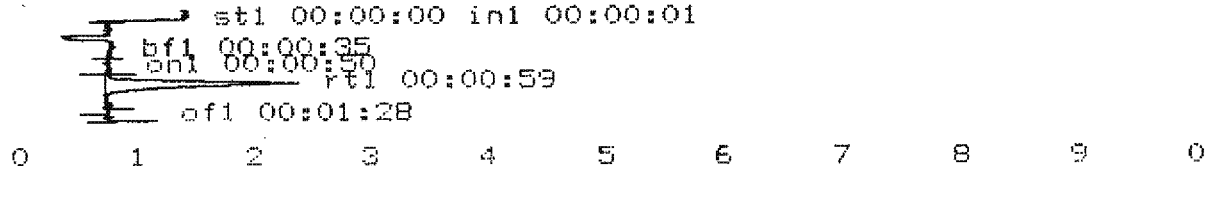


Run number, Inject time, Port name and number, Lows, Highs
1210030466, 02:21:32 PM, none 9, 2, 3

Substance, Samples, Present counts, Concentration
1 eto, 29, 22787, 4.85 ppm WBII inlet

Substance, Time Weighted Average, Time Interval
1 eto, 1.44 ppm, 06:48:24

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 30.1 ppm, 8

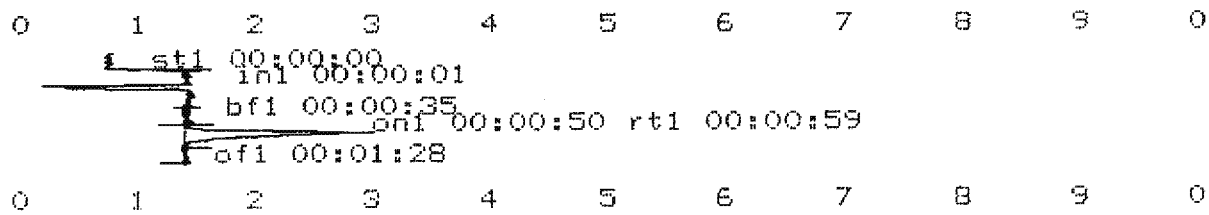


Run number, Inject time, Port name and number, Lows, Highs
1210030467, 02:23:32 PM, none 9, 2, 3

Substance, Samples, Present counts, Concentration
1 eto, 30, 23008, 4.90 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 1.46 ppm, 06:50:24

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 20.6 ppm, 7

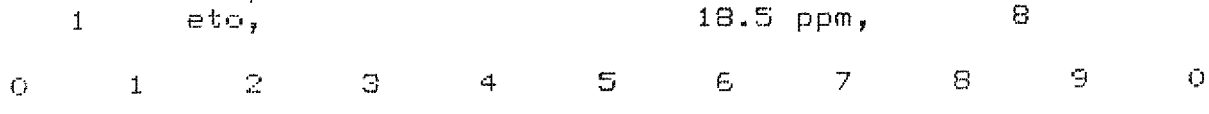


Run number, Inject time, Port name and number, Lows, Highs
1210030468, 02:25:30 PM, none 9, 2, 3

Substance, Samples, Present counts, Concentration
1 eto, 31, 21831, 4.65 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 1.47 ppm, 06:52:22

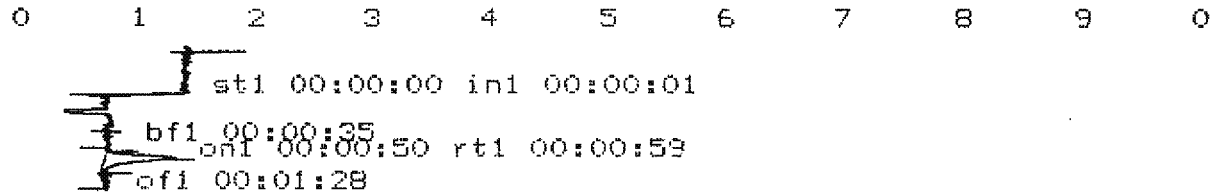
Substance, 15 Minute Short Term Exposure, Samples
1 eto, 18.5 ppm, 8



Substance, Samples, Present counts, Concentration
1 eto, 25, 278206, 59.2 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 1.21 ppm, 06:40:09

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 26.3 ppm, 8

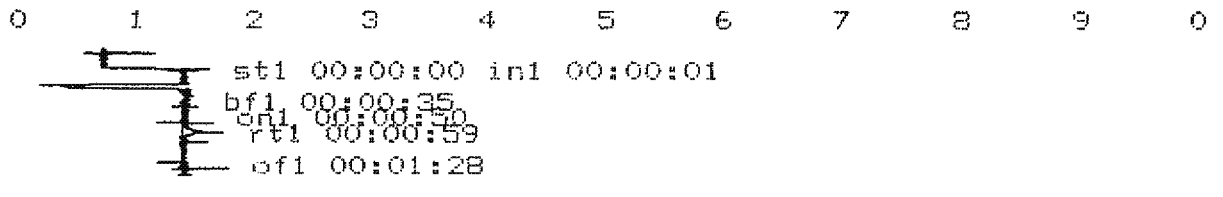


Run number, Inject time, Port name and number, Lows, Highs
1210030463, 02:15:39 PM, none 9, 1, 3

Substance, Samples, Present counts, Concentration
1 eto, 26, 9354, 1.99 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 1.38 ppm, 06:42:31

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 33.6 ppm, 7

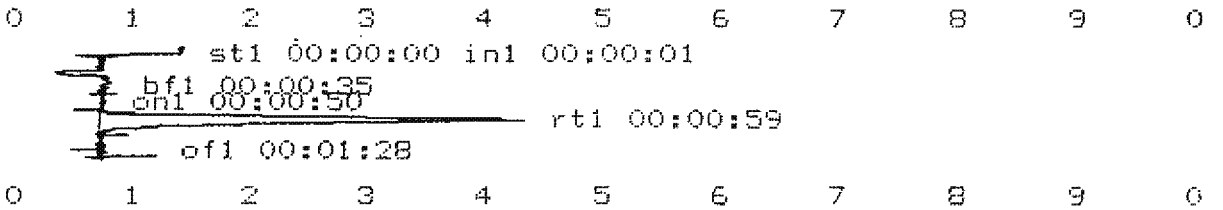


Run number, Inject time, Port name and number, Lows, Highs
1210030464, 02:17:36 PM, none 9, 1, 3

Substance, Samples, Present counts, Concentration
1 eto, 27, 2034, 0.433 ppm WBII outlet

Substance, Time Weighted Average, Time Interval
1 eto, 1.38 ppm, 06:44:28

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 32.8 ppm, 7

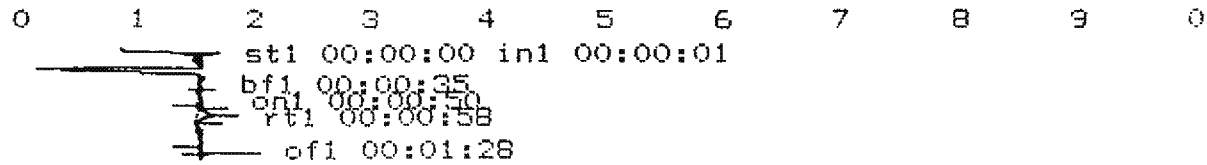


Run number, Inject time, Port name and number, Lows, Highs
1210030465, 02:19:30 PM, none 9, 2, 3

Substance, Samples, Present counts, Concentration
1 eto, 28, 56940, 12.1 ppm

Substance, Time Weighted Average, Time Interval

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.838 ppm, 6

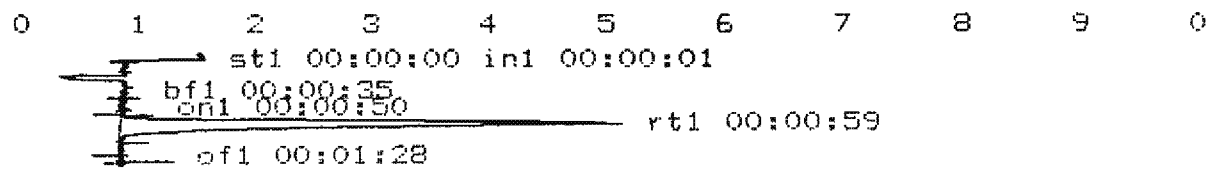


Run number, Inject time, Port name and number, Lows, Highs
1210030456, 02:00:38 PM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 19, 2086, 0.444 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.262 ppm, 06:27:30

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.784 ppm, 7

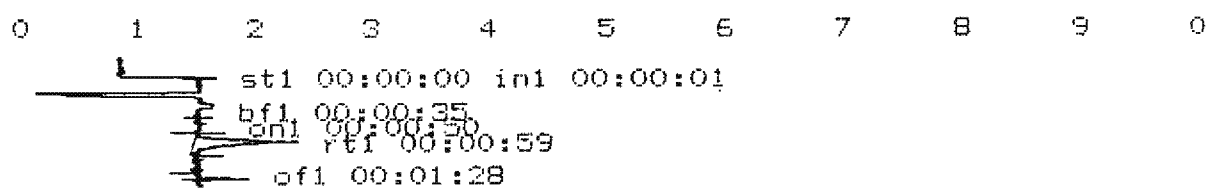


Run number, Inject time, Port name and number, Lows, Highs
1210030457, 02:02:33 PM, none 9, 1, 0

Substance, Samples, Present counts, Concentration
1 eto, 20, 68681, 14.6 ppm WBI inlet

Substance, Time Weighted Average, Time Interval
1 eto, 0.298 ppm, 06:29:25

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 1.77 ppm, 8

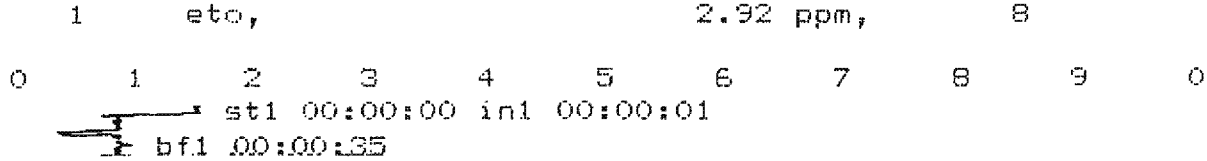


Run number, Inject time, Port name and number, Lows, Highs
1210030458, 02:04:37 PM, none 9, 1, 0

Substance, Samples, Present counts, Concentration
1 eto, 21, 10439, 2.22 ppm WBII outlet AF

Substance, Time Weighted Average, Time Interval
1 eto, 0.341 ppm, 06:31:29

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 2.92 ppm, 8



of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1210030459, 02:06:33 PM, none 9, 1, 0

Substance, Samples, Present counts, Concentration
1 eto, 22, 7630, 1.62 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.349 ppm, 06:33:25

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 3.07 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35 on1 00:00:50 rt1 00:00:55
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1210030460, 02:08:29 PM, none 9, 1, 1

Substance, Samples, Present counts, Concentration
1 eto, 23, 272968, 58.1 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.493 ppm, 06:35:21

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 7.18 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:55
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1210030461, 02:10:50 PM, none 9, 1, 2

Substance, Samples, Present counts, Concentration
1 eto, 24, 290098, 61.8 ppm WBII inlet A.F

Substance, Time Weighted Average, Time Interval
1 eto, 0.845 ppm, 06:37:42

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 16.9 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00
in1 00:00:01
bf1 00:00:35 on1 00:00:50 rt1 00:00:55
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs

```
0     1     2     3     4     5     6     7     8     9     0
        on1 00:00:50
        rt1 00:00:58
        of1 00:01:28
0     1     2     3     4     5     6     7     8     9     0

 Run number, Inject time, Port name and number, Lows, Highs
 1218030389, 11:56:34 AM,            none    9,    0,     0

   Substance, Samples, Present counts, Concentration
   1     eto,      15,           3624,     0.858 ppm

   Substance, Time Weighted Average, Time Interval
   1     eto,              0.159 ppm,      04:45:33

   Substance, 15 Minute Short Term Exposure, Samples
   1     eto,                      0.620 ppm,       7

0     1     2     3     4     5     6     7     8     9     0
        st1 00:00:00 in1 00:00:01
      bf1 00:00:35
      on1 00:00:50
        rt1 00:00:57
        of1 00:01:28
0     1     2     3     4     5     6     7     8     9     0

 Run number, Inject time, Port name and number, Lows, Highs
 1218030390, 11:58:31 AM,            none    9,    0,     0

   Substance, Samples, Present counts, Concentration
   1     eto,      16,           3445,     0.816 ppm

   Substance, Time Weighted Average, Time Interval
   1     eto,              0.163 ppm,      04:47:30

   Substance, 15 Minute Short Term Exposure, Samples
   1     eto,                      0.653 ppm,       8

0     1     2     3     4     5     6     7     8     9     0
        st1 00:00:00 in1 00:00:01
        bf1 00:00:35
        on1 00:00:50 rt1 00:00:58
        of1 00:01:28
0     1     2     3     4     5     6     7     8     9     0

 Run number, Inject time, Port name and number, Lows, Highs
 1218030391, 12:00:27 PM,            none    9,    0,     0

   Substance, Samples, Present counts, Concentration
   1     eto,      17,           3752,     0.888 ppm

   Substance, Time Weighted Average, Time Interval
   1     eto,              0.168 ppm,      04:49:26
```

1.1PPM

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.678 ppm, 9

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:57
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1218030392, 12:02:21 PM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 18, 1633, 0.387 ppm WBI outlet

Substance, Time Weighted Average, Time Interval
1 eto, 0.171 ppm, 04:51:20

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.790 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:56
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1218030393, 12:04:16 PM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 19, 1421, 0.336 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.172 ppm, 04:53:15

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.724 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:56
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1218030394, 12:06:11 PM, none 9, 1, 0

Substance, Samples, Present counts, Concentration
1 eto, 20, 52847, 12.5 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.213 ppm, 04:55:10

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 1.53 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35

0 1 2 3 4 5 6 7 8 9 0

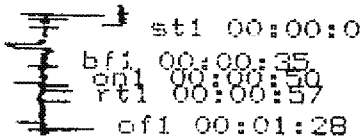
Run number, Inject time, Port name and number, Lows, Highs
1218030395, 12:08:14 PM, none 9, 2, 0

Substance, Samples, Present counts, Concentration
1 eto, 21, 54813, 13.0 ppm WBI inlet

Substance, Time Weighted Average, Time Interval
1 eto, 0.299 ppm, 04:57:13

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 3.34 ppm, 8

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

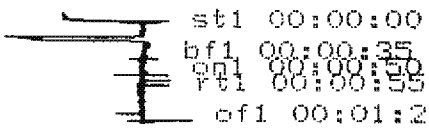
Run number, Inject time, Port name and number, Lows, Highs
1218030396, 12:10:24 PM, none 9, 2, 0

Substance, Samples, Present counts, Concentration
1 eto, 22, 371, 0.0879 ppm WBII outlet

Substance, Time Weighted Average, Time Interval
1 eto, 0.344 ppm, 04:59:23

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 4.18 ppm, 8

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

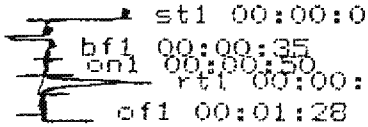
Run number, Inject time, Port name and number, Lows, Highs
1218030397, 12:12:19 PM, none 9, 2, 0

Substance, Samples, Present counts, Concentration
1 eto, 23, 488, 0.116 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.343 ppm, 05:01:18

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 4.08 ppm, 8

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1218030398, 12:14:13 PM, none 9, 2, 0

Substance, Time Weighted Average, Time Interval
1 eto, 0.161 ppm, 05:34:49

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.209 ppm, 4

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:57
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1223030437, 01:28:32 PM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 15, 1882, 0.437 ppm WB I OUTLE

Substance, Time Weighted Average, Time Interval
1 eto, 0.227 ppm, 05:44:04

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.743 ppm, 4

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:00:52
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1223030438, 01:30:27 PM, na 11, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 17, 443, 0.103 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.160 ppm, 05:38:38

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.196 ppm, 4

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:55
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

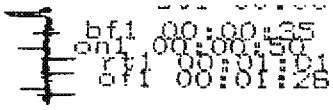
Run number, Inject time, Port name and number, Lows, Highs
1223030439, 01:32:22 PM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 16, 680, 0.158 ppm WB II OUTLE

Substance, Time Weighted Average, Time Interval
1 eto, 0.228 ppm, 05:47:54

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.597 ppm, 4

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

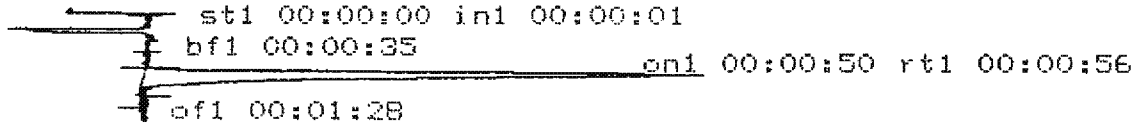
Run number, Inject time, Port name and number, Lows, Highs
1223030440, 01:34:16 PM, na 11, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 18, 711, 0.165 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.160 ppm, 05:42:27

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.151 ppm, 4

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

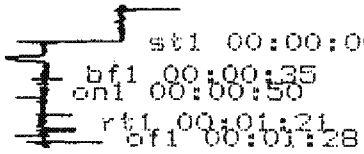
Run number, Inject time, Port name and number, Lows, Highs
1223030441, 01:36:12 PM, none 9, 1, 0

Substance, Samples, Present counts, Concentration
1 eto, 17, 73722, 17.1 ppm WB I INRT

Substance, Time Weighted Average, Time Interval
1 eto, 0.320 ppm, 05:51:44

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 3.20 ppm, 4

0 1 2 3 4 5 6 7 8 9 0



0 1 2 3 4 5 6 7 8 9 0

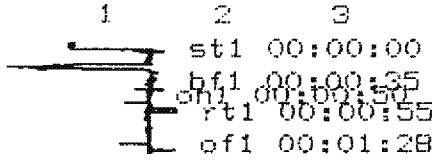
Run number, Inject time, Port name and number, Lows, Highs
1223030442, 01:38:34 PM, na 11, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 19, 1133, 0.263 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.161 ppm, 05:46:45

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.146 ppm, 4

0 1 2 3 4 5 6 7 8 9 0



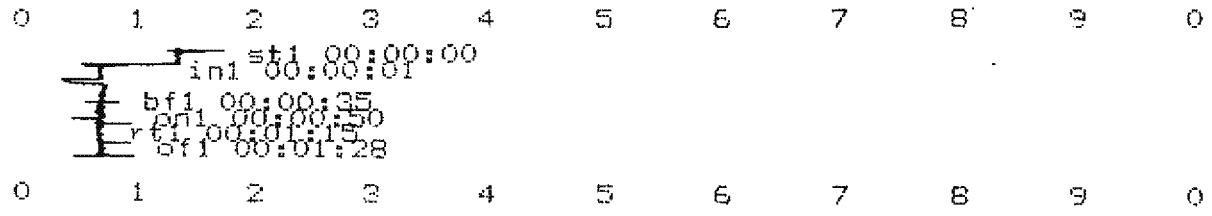
0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1223030433, 01:20:53 PM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 13, 3018, 0.700 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.216 ppm, 05:36:25

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.626 ppm, 3

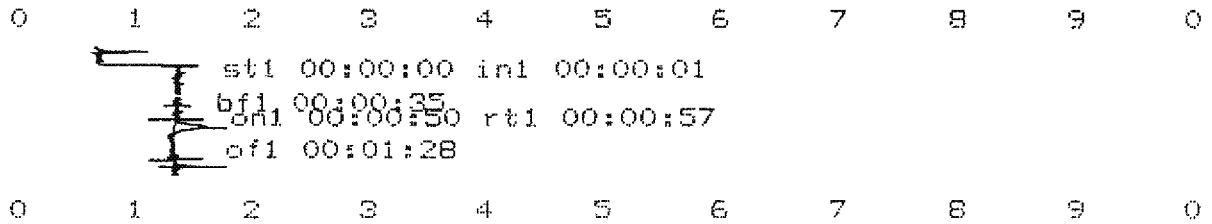


Run number, Inject time, Port name and number, Lows, Highs
1223030434, 01:22:47 PM, na 11, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 15, 1760, 0.408 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.160 ppm, 05:30:58

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.186 ppm, 5



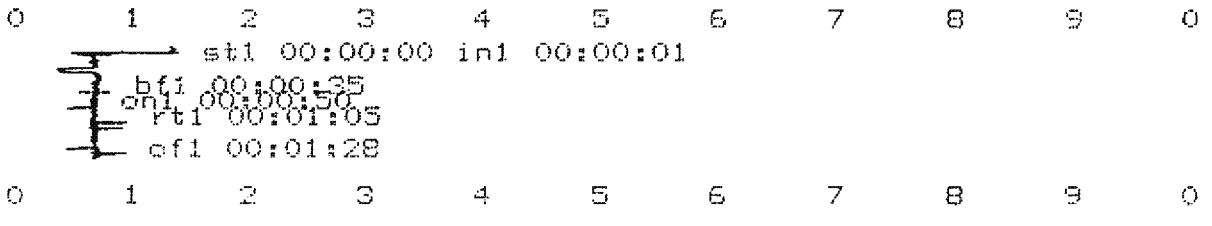
Run number, Inject time, Port name and number, Lows, Highs
1223030435, 01:24:42 PM, none 9, 0, 0

Substance, Samples, Present counts, Concentration
1 eto, 14, 3987, 0.925 ppm

EALT GAS
1.0 PPM

Substance, Time Weighted Average, Time Interval
1 eto, 0.222 ppm, 05:40:14

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.688 ppm, 4



Run number, Inject time, Port name and number, Lows, Highs
1223030436, 01:26:38 PM, na 11, 0, 0

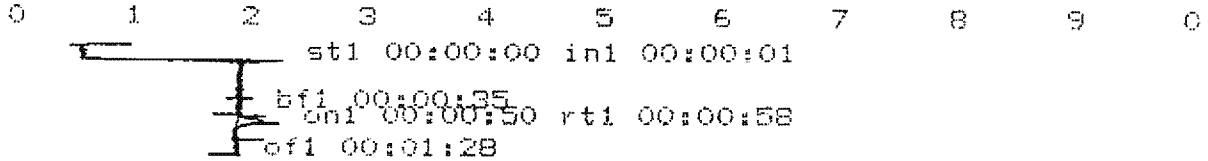
Substance, Samples, Present counts, Concentration
1 eto, 16, 272, 0.0631 ppm

Run number, Inject time, Port name and number, Lows, Highs
1231030357, 11:02:10 AM, none 9, 3, 0

Substance, Samples, Present counts, Concentration
1 eto, 13, 3812, 0.771 ppm 1.1 PPM

Substance, Time Weighted Average, Time Interval
1 eto, 0.834 ppm, 03:51:57

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 14.5 ppm, 6

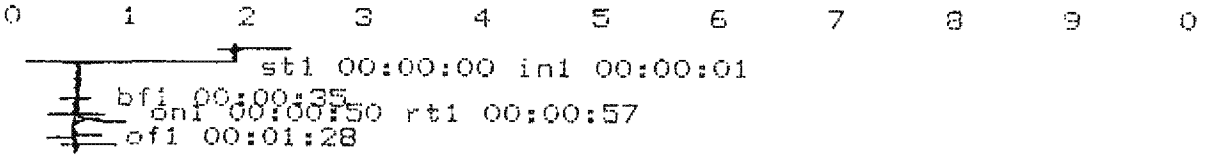


Run number, Inject time, Port name and number, Lows, Highs
1231030358, 11:04:06 AM, none 9, 3, 0

Substance, Samples, Present counts, Concentration
1 eto, 14, 3078, 0.622 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.833 ppm, 03:53:53

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 12.1 ppm, 7



Run number, Inject time, Port name and number, Lows, Highs
1231030359, 11:06:01 AM, none 9, 3, 0

Substance, Samples, Present counts, Concentration
1 eto, 15, 3187, 0.644 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.831 ppm, 03:55:48

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 10.4 ppm, 8

on1 00:00:50
rt1 00:00:57
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1231030362, 11:11:46 AM, none 9, 3, 0

Substance, Samples, Present counts, Concentration
1 eto, 18, 717, 0.145 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.818 ppm, 04:01:33

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 2.19 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50
rt1 00:01:24 of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1231030363, 11:13:41 AM, none 9, 3, 0

Substance, Samples, Present counts, Concentration
1 eto, 19, 1231, 0.249 ppm WBI outlet

Substance, Time Weighted Average, Time Interval
1 eto, 0.814 ppm, 04:03:28

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.466 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:57
of1 00:01:28

0 1 2 3 4 5 6 7 8 9 0

Run number, Inject time, Port name and number, Lows, Highs
1231030364, 11:15:35 AM, none 9, 4, 0

Substance, Samples, Present counts, Concentration
1 eto, 20, 34673, 7.01 ppm

Substance, Time Weighted Average, Time Interval
1 eto, 0.835 ppm, 04:05:22

Substance, 15 Minute Short Term Exposure, Samples
1 eto, 0.865 ppm, 8

0 1 2 3 4 5 6 7 8 9 0

st1 00:00:00 in1 00:00:01
bf1 00:00:35
on1 00:00:50 rt1 00:00:57

IBA

ETR
1-24-03

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Orange
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February 21, 2003

IEPA-DIVISION OF RECORDS MANAGEMENT
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Environmental Protection Agency
Bureau of Air
State of Illinois

U.S Environmental Protection Agency-Region V
Air Enforcement and Compliance Assurance Branch
Attn: Compliance Tracker (AE-17J)
77 West Jackson Blvd.
Chicago, IL. 60604-3590

Re: IBA/Griffith Micro Science Administrative Order-Willowbrook I & II Performance Test Results

Dear Ms. Bush:

IBA S&I, Inc. has requested Dan Kremer of Kremer Environmental Services, Inc. to submit the January 23-24 Performance Test results to you and Ms. Julie Armitage as required by Section 39 of the Administrative Order dated December 24, 2002. Please let me know if you fail to receive this report by Monday, February 24, 2003.

The purpose of this letter is to further review the performance test results and discuss subsequent work regarding the implementation of the Administrative Order. Willowbrook I had its Performance Test conducted on January 23, 2003 while Willowbrook II had its test on January 24, 2003. For Willowbrook I, the ethylene oxide concentration from the AAT system was less than 0.01 ppm. The ethylene oxide concentration from the Willowbrook II AAT System was 0.64 ppm.

Because of the rather high ethylene oxide emission level from the Willowbrook II AAT System, the plant partially replenished the AAT scrubber solution and totally replaced the dry bed adsorbent material. This was done in spite of obtaining less than 1 ppm Ethylene Oxide level for the AAT System outlet.

The results of the comparison of the readings from the Baseline and Perkin Elmer GCs to Dan Kremer's GCs showed that generally the results from the Baseline and Perkin Elmer systems were higher than those from the third-party tester. We believe that the discrepancies between these readings resulted from a number of reasons:

For Sampling:
1) We found that the sample valves on the two new Vac-U-Chambers that we purchased for sampling were defective and pulling in ambient air. We have discontinued using these and are currently using air sampling pumps.
2) We found that we needed to use ten (10) liter gas bags rather than one (1) or three (3) liter bags. We are now using ten (10) liter bags so that we have sufficient gas to test in both GCs.

3) We recently found that the method that we were using to test the samples in the Perkin Elmer GC did not always provide the most reliable results. We have subsequently modified our testing methodology through this equipment.

We believe that the above reasons and the subsequent modifications should address the discrepancies between the readings during the performance test. To further test our plant GC systems, we will now be sending gas samples off-site to Clean Air Engineering to check the accuracy of these results. This will be continued until we believe that our results are equivalent to a third-party laboratory.

Lastly, neither of the OVA meters performed well. We, therefore, have ceased using them.

I hope that this letter provides you with sufficient information to show our commitment to meeting each and every element of the Administrative Order. We would be happy to meet with you at any time to further discuss these results. Call me with any questions you might have. You can reach me at 630-928-1724.

Yours truly,

Stephen Dana Morris
Director EH&S

cc: Julie Armitage, Section Manager
Compliance and Systems Management Section
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John Gilbert, Vice-President Operations
Mark Bogs, Willowbrook General Manager
Byron F. Taylor, Esq.
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REPORT OF
AIR POLLUTION SOURCE TESTING
OF TWO ETHYLENE OXIDE EMISSION-CONTROL SYSTEMS
OPERATED BY IBA, INC.
AT THE TWO ETHYLENE OXIDE STERILIZATION FACILITIES
IN WILLOWBROOK, ILLINOIS
ON JANUARY 23-24, 2003

Submitted to:

Air Enforcement and Compliance Assurance Branch
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION 5
77 West Jackson Boulevard
Chicago, Illinois 60604

Compliance and Systems Management Section
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
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Submitted by:

IBA, INC.
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I.D. Number 043110AAC

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Environmental Protection Agency
Bureau of Air
State of Illinois

Prepared by:

KREMER ENVIRONMENTAL SERVICES, INC.
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February 10, 2003

KES

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1.0 INTRODUCTION

On Thursday, January 23 and Friday, January 24, 2003, Kremer Environmental Services, Inc. performed air pollution source testing of two ethylene oxide (EtO) emission-control systems operated by IBA, Inc. at their two ethylene oxide sterilization facilities in Willowbrook, Illinois. At each facility, the control device that was tested is a two-stage Advanced Air Technologies (AAT) Safe Cell emission-control system, comprised of a packed-tower chemical scrubber (SC1) and a dry-bed reactor (SC2). At Willowbrook I, the AAT system is currently used to control emissions from eight aeration chambers and three aeration rooms. At Willowbrook II, the AAT system is currently used to control emissions from two aeration rooms and from three sterilizer vacuum pumps.

The purpose of the testing program was to evaluate compliance with the conditions established in the Administrative Order, dated December 24, 2002, issued by the United States Environmental Protection Agency (USEPA), Region 5 to IBA, Inc.

The specific conditions of the Administrative Order require the following:

- IBA shall conduct performance testing of all of the aeration room vents' emission control equipment at the Willowbrook facilities to determine compliance status with respect to the site-specific limits for the parameters in the alternative monitoring plan.

- IBA shall conduct performance testing of all aeration room vents' emission control equipment at the Willowbrook facilities in accordance with the test methods and procedures outlined in USEPA CFR40, Part 63.365.

- IBA shall conduct the performance testing under normal operating conditions representative of the maximum ethylene oxide emissions potential.

- During each performance test run, IBA shall measure and record the ethylene oxide concentration at the aeration room vents' emission control equipment outlets, using each of the two portable Flame Ionization Detectors (FID) for at least fifteen minutes.

- During each performance test run, IBA measured and recorded the ethylene oxide concentration at each of the aeration room vents' emission control equipment outlets by collecting a fifteen-minute bag sample that were analyzed by an on-site gas chromatograph (GC) system, one of which is operated by IBA at each facility for ambient monitoring purposes.

Compliance must also be demonstrated with USEPA requirements under the current National Emissions Standards for Hazardous Air Pollutants (NESHAP), and with the conditions established in the Air Quality Permit granted to IBA by the Illinois Environmental Protection Agency (IEPA), Air Pollution Control Division.

2.0 EQUIPMENT

At both the Willowbrook I and Willowbrook II facilities, aeration emissions are controlled by:

- One two-stage Advanced Air Technologies Safe Cell emission-control system, comprised of a packed-tower chemical scrubber (SC1), equipped with a packed reaction/interface column, a scrubber fluid recirculation system, and a scrubber fluid reaction/storage tank, and a dry bed reactor/scrubber (SC2), comprised of a bank of solid-bed reaction vessels, connected in parallel, installed downstream of SC1 and upstream of a dedicated blower exhaust system.

3.0 TESTING

EtO source testing was conducted in accordance with the procedures outlined in USEPA CFR40, Part 63.365. EtO emissions monitoring for each test run was conducted simultaneously at the inlet and outlet during a one-hour interval of the aeration process. Three one-hour test runs were performed at the inlet (inlet of SC1) and outlet (outlet of SC2) of the Safe Cell System, and three one-hour test runs were performed at the inlet and outlet of SC2 alone. A total of six one-hour aeration test runs were performed.

During the aeration phase, EtO emissions at the inlet and the outlet of the Safe Cell System were determined using direct source sample injection into a GC. All testing was conducted during normal process load conditions. All aeration testing was performed after freshly sterilized product has been transferred into an aeration chamber/room. The testing program was conducted in accordance with the procedures outlined in the following sections.

The results obtained by Kremer Environmental Services, Inc. were compared to the results obtained by the IBA, Inc. portable FID's and on-site GC's to determine their consistency.

4.0 RULE/COMPLIANCE REQUIREMENTS

The EtO gas-sterilization systems at the Willowbrook I and Willowbrook II facilities are being tested to determine compliance with the conditions outlined in the Administrative Order issued to IBA, Inc. by the USEPA, with the current federal EPA National Emissions Standard for Hazardous Air Pollutants (NESHAP) for ethylene oxide, and with the requirements specified in the Illinois EPA Permit. This testing was performed to demonstrate compliance with the following requirements:

- The emissions from the aeration process must be discharged to control equipment with an EtO emission-reduction efficiency of at least 99.0% by weight.

  or

  The EtO concentration at the outlet of the control equipment to which emissions from the aeration process are discharged to must not exceed 1 ppm.

- Ethylene oxide measurements utilizing the two portable Flame Ionization Detectors (FID), and the plant's on-site gas chromatograph (GC), must be consistent with the testing equipment utilized by the outside testing service.

Testing is required to demonstrate compliance with these requirements. Source testing of the emission-control device is required initially, and may be required periodically thereafter.

5.0 TEST METHOD REFERENCE

5.1 INTRODUCTION

The testing procedures outlined herein are based on USEPA source-sampling methods. EtO control efficiency and mass-emissions testing were conducted by USEPA CFR40, Part 63.365, and in accordance with IEPA requirements. EtO emissions monitoring for each test run was conducted simultaneously at the inlet and outlet during a one-hour interval of the aeration process. Three one-hour test runs were performed at the inlet (inlet of SC1) and outlet (outlet of SC2) of the Safe Cell System, and three one-hour test runs were performed at the inlet and outlet of SC2 alone. A total of six one-hour aeration test runs were performed.

During the aeration phase, EtO emissions at the inlet and the outlet of the Safe Cell System were determined using direct source sample injection into a GC. All testing was conducted during normal process load conditions. All aeration testing was performed after freshly sterilized product has been transferred into an aeration chamber/room. The testing program was conducted in accordance with the procedures outlined in the following sections.

The results obtained by Kremer Environmental Services, Inc. were compared to the results obtained by the IBA, Inc. portable FID's and on-site GC's to determine their consistency.

Operation and documentation of process conditions were performed by personnel from IBA using existing monitoring instruments installed by the manufacturer on the equipment that was tested. In accordance with the procedures established in USEPA CFR40, Part 63, Subpart O, scrubber liquor level was recorded.

5.2 VOLUMETRIC FLOW MEASUREMENT

Exhaust gas flow through the emission control system was determined by EPA Method 2C using a standard pitot tube and an inclined-oil manometer. In accordance with EPA Method 1, sampling ports were located far enough from any flow disturbances to permit accurate flow measurement.

Temperature measurements were obtained from a type K thermocouple and thermometer attached to the sampling probe. Exhaust gas composition was assumed to be air and small amounts of water vapor. Water vapor was negligible, at about 3 percent.

5.3 CONTROL EFFICIENCY AND MASS EMISSIONS MEASUREMENT

During aeration, EtO emissions at the inlet and outlet of the Safe Cell System were determined using direct source sample injection into the GC. The mass of EtO emitted to the inlet and from the outlet of the Safe Cell System was determined using Equation 1, shown below in Section 5.9. Mass-mass control-efficiency of EtO during aeration was calculated by comparing the mass of EtO vented to the system inlet to the mass of EtO vented from the system outlet.

During aeration, vented gas was analyzed by an SRI, Model 8610, portable gas chromatograph (GC), equipped with the following: dual, heated sample loops and injectors; dual columns; and dual detectors. A flame ionization detector (FID) was used to quantify high-level EtO emissions, and a photoionization detector (PID) was used to quantify low-level EtO emissions at the emission-control device outlet.

5.4 SAMPLE TRANSPORT

Source gas was pumped to the GC at approximately 500 cubic centimeters per minute (cc/min) from the sampling ports through two lengths of Teflon® sample line, each with a nominal volume of approximately 75 cubic centimeters (cc) and an outer diameter of 0.25 inch. At the inlet of the Safe Cell System (inlet of SC1), the sampling port was located in the aeration discharge duct, upstream of the scrubber. At the outlet of the Safe Cell System (outlet of SC2), sampling port was located in the exhaust stack downstream of the exhaust blower. For sampling of SC2 alone, the inlet sample port was located in the duct upstream of the inlet of SC2, and the outlet sampling port was located in the exhaust stack downstream of the exhaust blower.

5.5 GC INJECTION

Source-gas samples were then injected into the GC which was equipped with two heated sampling loops, each containing a volume of approximately 2cc and maintained at 100 degrees Celsius (C). Injections occurred at approximately five-minute intervals during aeration. Helium was the carrier gas for both the FID and PID.

5.6 GC CONDITIONS

The packed columns for the GC were both operated at 85 degrees C. The columns were stainless steel, 6 feet long, 0.125 inch outer diameter, packed with 1 percent SP-1000 on 60/80 mesh Carbopack B, or equivalent.

During the analysis, the FID was operated at 250 degrees C. The support gases for the FID were hydrogen (99.995% pure) and air (99.9999% pure). Any unused sample gas was vented from the GC system back to the inlet of the scrubber.

5.7 CALIBRATION STANDARDS

The FID used at the inlet was calibrated for part-per-million-by-volume (ppmv)-level analyses using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

The PID used at the outlet was calibrated for ppmv-level analyses using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

Each of these calibration standards was in a separate, certified manufacturer's cylinder. Copies of the calibration gas laboratory certificates are attached as Appendix P.

5.8 SAMPLING DURATION

Since aeration is a 24-hour process at this facility, with constant discharge flow from the aeration chambers to the emission-control system, aeration testing consisted of a total of six 1-hour test runs. Each test run was performed after freshly sterilized product had been transferred into an aeration chamber/room.

5.9 CONTROL-EFFICIENCY/MASS-EMISSIONS CALCULATIONS

Mass emissions of EtO during aeration were calculated using the following equation:

EQUATION 1:

$$\text{MassRate} = (\text{VolFlow})(\text{MolWt})(\text{ppmv EtO}/10^6)/(\text{MolVol})$$

Where:

MassRate	=	EtO mass flow rate, pounds per minute
VolFlow	=	Corrected volumetric flow rate, standard cubic feet per minute at 68 degrees F
MolWt	=	44.05 pounds EtO per pound mole
ppmv EtO	=	EtO concentration, parts per million by volume
10^6	=	Conversion factor, ppmv per "cubic foot per cubic foot"
MolVol	=	385.32 cubic feet per pound mole at one atmosphere and 68 degrees F

Note: Standard conditions are 68°F and 1 atm.

Mass-mass control efficiency of EtO was calculated for aeration. Results of the control-efficiency testing are summarized in Section 8.0, and in Tables 1 through 4.

6.0 TEST SCENARIO

The aeration testing was performed during normal process load conditions, after freshly sterilized product had been transferred into an aeration chamber/room. Three test runs were conducted in series to verify the performance of the emission-control device. The testing schedule was the same for both days of testing, and was as follows:

Day One - Willowbrook I - Thursday, January 23, 2003
Day Two - Willowbrook II - Friday, January 24, 2003

1) Equipment setup and gas chromatograph calibration.
2) Aeration Test Run #1 was performed with at least one freshly sterilized production load transferred into aeration. Sampling was performed at the inlet of SC1 and the outlet of SC2.
3) Aeration Test Run #2 was performed with at least one freshly sterilized production load transferred into aeration. Sampling was performed at the inlet of SC1 and the outlet of SC2.
4) Aeration Test Run #3 was performed with at least one freshly sterilized production load transferred into aeration. Sampling was performed at the inlet of SC1 and the outlet of SC2.
5) Testing equipment was set up for monitoring at the inlet and outlet of SC2.
6) Aeration Test Run #4 was performed with at least one freshly sterilized production load transferred into aeration. Sampling was performed at the inlet and outlet of SC2.
7) Aeration Test Run #5 was performed with at least one freshly sterilized production load transferred into aeration. Sampling was performed at the inlet and outlet of SC2.
8) Aeration Test Run #6 was performed with at least one freshly sterilized production load transferred into aeration. Sampling was performed at the inlet and outlet of SC2.
9) Post-calibration check performed and equipment breakdown.

7.0 QA/QC

7.1 FIELD TESTING QUALITY ASSURANCE

At the beginning of the test, the sampling system was leak checked at a vacuum of 15 inches of mercury. The sampling system was considered leak free when the flow indicated by the rotameters fell to zero.

At the beginning of the test, a system blank was analyzed to ensure that the sampling system was free of EtO. Ambient air was introduced at the end of the heated sampling line and drawn through the sampling system line to the GC for analysis. The resulting chromatogram also provided a background level for non-EtO components (ie. ambient air, carbon dioxide, water vapor) which are present in the source gas stream due to the ambient dilution air which is drawn into the emission-control device. This chromatogram, designated AMB, is included with the calibration data in Appendix A.

7.2 CALIBRATION PROCEDURES

The GC system was calibrated at the beginning and conclusion of each day's testing. Using the Peaksimple II analytical software, a point-to-point calibration curve was constructed for each detector. A gas cylinder of similar composition as the calibration gases, but certified by a separate supplier, was used to verify calibration gas composition and GC performance.

All calibration gases and support gases used were of the highest purity and quality available. A copy of the laboratory certification for each calibration gas is attached as Appendix P.

Each of the portable FID's, and the IBA on-site GC's, were calibrated according to IBA's Tiered Monitoring Plan. Calibration was performed by IBA employees.

8.0 TEST RESULTS

At both the Willowbrook I and II facilities, the emission-control systems demonstrated compliance with the less than 1 ppm outlet concentration requirement while controlling emissions from the aeration process. In accordance with state and federal requirements, the EtO concentration at the outlet of the control equipment to which emissions from the aeration process are discharged to must not exceed 1 ppm. Both emission-control systems met this requirement. The test results are summarized in Table 1 through 4.

Results of the comparative monitoring are presented in Appendix O. The two tables show the comparative results of the monitoring and bag sample analysis performed by Kremer Environmental Services, Inc. and by personnel from IBA, Inc. The comparative monitoring was performed in accordance with the Administrative Order, dated December 24, 2002, issued by the United States Environmental Protection Agency (USEPA), Region 5 to IBA, Inc.

Chromatograms and chromatographic supporting data are attached as Appendices A through M. Copies of field data and calculation worksheets are attached as Appendix N.

TABLES

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TABLE 1
AERATION PHASE ETHYLENE OXIDE CONTROL EFFICIENCY OF AN AAT SAFE CELL EMISSION CONTROL SYSTEM (SC1 & SC2) OPERATED BY IBA/GRIFFITH MICROSCIENCE, INC. IN WILLOWBROOK, ILLINOIS (PLANT 1) ON JANUARY 23, 2003

RUN NUMBER	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
1(3)	1613	74.8	0.01	99.9866
1	1618	75.7	0.01	99.9868
1	1623	76.2	0.01	99.9869
1	1628	77.1	0.01	99.9870
1	1633	75.8	0.01	99.9868
1	1638	76.4	0.01	99.9869
1	1643	74.5	0.01	99.9866
1	1648	72.5	0.01	99.9862
1	1653	75.0	0.01	99.9867
1	1658	77.3	0.01	99.9871
1	1703	77.8	0.01	99.9871
1	1708	81.2	0.01	99.9877
2(4)	1713	89.7	0.01	99.9889
2	1718	91.4	0.01	99.9891
2	1723	89.4	0.01	99.9888
2	1728	92.4	0.01	99.9892
2	1733	93.0	0.01	99.9892
2	1738	93.1	0.01	99.9893
2	1743	93.0	0.01	99.9892
2	1748	93.1	0.01	99.9893
2	1753	87.9	0.01	99.9886
2	1758	85.2	0.01	99.9883
2	1803	82.8	0.01	99.9879
2	1808	84.1	0.01	99.9881
3(5)	1813	81.3	0.01	99.9877
3	1818	80.9	0.01	99.9876
3	1823	79.2	0.01	99.9874
3	1828	76.5	0.01	99.9869
3	1833	73.7	0.01	99.9864
3	1838	67.3	0.01	99.9851
3	1843	65.6	0.01	99.9848
3	1848	68.5	0.01	99.9854
3	1853	69.9	0.01	99.9857
3	1858	70.0	0.01	99.9857
3	1903	71.0	0.01	99.9859
3	1908	69.8	0.01	99.9857
TIME-WEIGHTED AVERAGE:		**79.5**	**0.0100**	**99.9873**
		REQUIRED CONTROL EFFICIENCY:		**99**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
(3) - Aeration Run #1 started at 16:10, ended at 17:10.
(4) - Aeration Run #2 started at 17:10, ended at 18:10.
(5) - Aeration Run #3 started at 18:10, ended at 19:10.

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TABLE 2
AERATION PHASE ETHYLENE OXIDE CONTROL EFFICIENCY OF AN AAT SAFE CELL EMISSION CONTROL SYSTEM (SC2 ONLY) OPERATED BY IBA/GRIFFITH MICROSCIENCE, INC. IN WILLOWBROOK, ILLINOIS (PLANT 1) ON JANUARY 23, 2003

RUN NUMBER	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
1(3)	1954	8.32	0.01	99.8798
1	1959	8.08	0.01	99.8762
1	2004	7.87	0.01	99.8729
1	2009	7.96	0.01	99.8744
1	2014	7.98	0.01	99.8747
1	2019	8.24	0.01	99.8786
1	2024	7.82	0.01	99.8721
1	2029	7.66	0.01	99.8695
1	2034	7.88	0.01	99.8731
1	2039	8.01	0.01	99.8752
1	2044	7.70	0.01	99.8701
1	2049	7.91	0.01	99.8736
2(4)	2054	7.90	0.01	99.8734
2	2059	8.36	0.01	99.8804
2	2104	8.62	0.01	99.8840
2	2109	8.83	0.01	99.8867
2	2114	9.16	0.01	99.8908
2	2119	9.49	0.01	99.8946
2	2124	9.54	0.01	99.8952
2	2129	9.43	0.01	99.8940
2	2134	9.55	0.01	99.8953
2	2139	9.72	0.01	99.8971
2	2144	9.78	0.01	99.8978
2	2149	9.89	0.01	99.8989
3(5)	2154	9.69	0.01	99.8968
3	2159	9.63	0.01	99.8962
3	2204	9.55	0.01	99.8953
3	2209	9.69	0.01	99.8968
3	2214	9.65	0.01	99.8964
3	2219	9.61	0.01	99.8959
3	2224	9.51	0.01	99.8948
3	2229	9.58	0.01	99.8956
3	2234	9.89	0.01	99.8989
3	2239	9.27	0.01	99.8921
3	2244	9.33	0.01	99.8928
3	2249	9.27	0.01	99.8921
TIME-WEIGHTED AVERAGE:		**8.90**	**0.0100**	**99.8867**
		REQUIRED CONTROL EFFICIENCY:		**na**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
(3) - Aeration Run #1 started at 19:50, ended at 20:50.
(4) - Aeration Run #2 started at 20:50, ended at 21:50.
(5) - Aeration Run #3 started at 21:50, ended at 22:50.

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TABLE 3
AERATION PHASE ETHYLENE OXIDE CONTROL EFFICIENCY OF AN AAT SAFE CELL EMISSION CONTROL SYSTEM (SC1 & SC2) OPERATED BY IBA/GRIFFITH MICROSCIENCE, INC. IN WILLOWBROOK, ILLINOIS (PLANT 2) ON JANUARY 24, 2003

RUN NUMBER	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
1(3)	1241	16.4	0.78	95.2439
1	1246	16.9	0.79	95.3254
1	1251	16.5	0.79	95.2121
1	1256	16.3	0.67	95.8896
1	1301	16.4	0.72	95.6098
1	1306	16.0	0.72	95.5000
1	1311	17.3	0.77	95.5491
1	1316	15.9	0.73	95.4088
1	1321	16.2	0.69	95.7407
1	1326	15.4	0.73	95.2597
1	1331	16.4	0.74	95.4878
1	1336	15.8	0.66	95.8228
3(4)	1358	16.7	0.71	95.7485
3	1403	15.8	0.64	95.9494
3	1408	16.0	0.61	96.1875
3	1413	14.8	0.60	95.9459
3	1418	14.8	0.54	96.3514
3	1423	15.0	0.61	95.9333
3	1428	14.7	0.68	95.3741
3	1433	14.8	0.58	96.0811
3	1438	14.3	0.54	96.2238
3	1443	14.5	0.61	95.7931
3	1448	14.6	0.65	95.5479
3	1453	14.9	0.64	95.7047
5(5)	1503	15.0	0.76	94.9333
5	1508	14.5	0.72	95.0345
5	1513	14.7	0.65	95.5782
5	1518	14.3	0.63	95.5944
5	1523	13.9	0.56	95.9712
5	1528	13.9	0.55	96.0432
5	1533	13.7	0.53	96.1314
5	1538	13.8	0.50	96.3768
5	1543	14.2	0.51	96.4085
5	1548	13.2	0.54	95.9091
5	1553	13.6	0.47	96.5441
5	1558	13.4	0.47	96.4925
TIME-WEIGHTED AVERAGE:		**15.13**	**0.6414**	**95.7752**
MAXIMUM ALLOWED OUTLET CONCENTRATION:			**1 PPM**	

Notes:
(1) - PPM = parts per million by volume
(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
(3) - Aeration Run #1 started at 12:40, ended at 13:40.
(4) - Aeration Run #3 started at 13:57, ended at 14:57.
(5) - Aeration Run #5 started at 15:02, ended at 16:02.

KES

TABLE 4
AERATION PHASE ETHYLENE OXIDE CONTROL EFFICIENCY OF AN AAT SAFE CELL EMISSION CONTROL SYSTEM (SC2 ONLY) OPERATED BY IBA/GRIFFITH MICROSCIENCE, INC. IN WILLOWBROOK, ILLINOIS (PLANT 2) ON JANUARY 24, 2003

RUN NUMBER	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
2(3)	1243	2.23	0.71	68.1614
2	1248	2.11	0.77	63.5071
2	1253	2.28	0.78	65.7895
2	1258	2.16	0.79	63.4259
2	1303	2.08	0.68	67.3077
2	1308	2.91	0.74	74.5704
2	1313	2.73	0.81	70.3297
2	1318	1.62	0.67	58.6420
2	1323	1.63	0.71	56.4417
2	1328	2.80	0.74	73.5714
2	1333	2.84	0.65	77.1127
2	1338	2.12	0.63	70.2830
4(4)	1401	2.13	0.66	69.0141
4	1406	1.97	0.65	67.0051
4	1411	2.04	0.62	69.6078
4	1416	1.85	0.59	68.1081
4	1421	1.92	0.61	68.2292
4	1426	1.89	0.58	69.3122
4	1431	2.07	0.58	71.9807
4	1436	1.92	0.63	67.1875
4	1441	1.81	0.63	65.1934
4	1446	1.92	0.66	65.6250
4	1451	1.95	0.60	69.2308
4	1456	1.89	0.58	69.3122
6(5)	1505	2.04	0.78	61.7647
6	1510	2.02	0.72	64.3564
6	1515	1.93	0.66	65.8031
6	1520	1.94	0.57	70.6186
6	1525	1.97	0.61	69.0355
6	1530	1.78	0.54	69.6629
6	1535	1.88	0.47	75.0000
6	1540	1.85	0.50	72.9730
6	1545	1.83	0.50	72.6776
6	1550	1.78	0.54	69.6629
6	1555	1.73	0.48	72.2543
6	1600	1.70	0.45	73.5294
TIME-WEIGHTED AVERAGE:		**2.04**	**0.6358**	**68.5080**
		REQUIRED CONTROL EFFICIENCY:		**na**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
(3) - Aeration Run #2 started at 12:40, ended at 13:40.
(4) - Aeration Run #4 started at 13:57, ended at 14:57.
(5) - Aeration Run #6 started at 15:02, ended at 16:02.

KES

APPENDICES

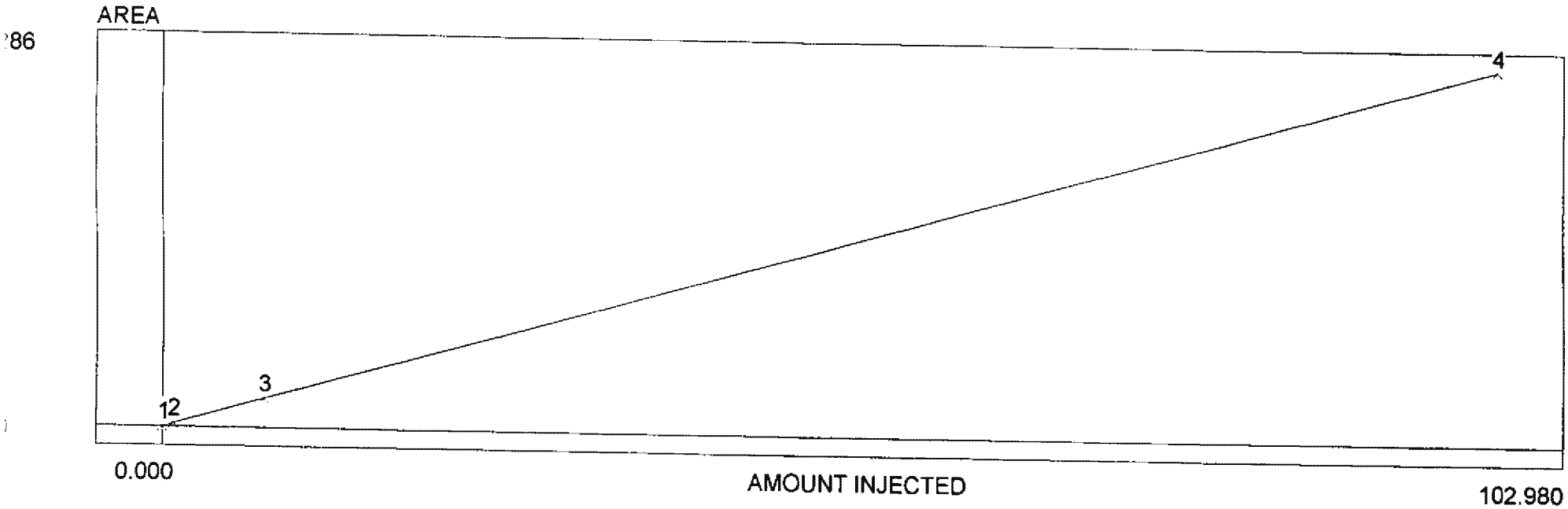
APPENDIX A

Calibration Data

Peak	Name	Start	End	Calibration	Int.Std	Units
1	Dead Vol / Air	0.000	0.300		0.000	
2	Ambient H2O	0.300	0.500		0.000	
3	Ethylene Oxide	0.500	0.600	2GW1.CAL	0.000	ppm
4	H2O / CO2	0.600	1.000		0.000	

ED_002192_00004534-00027

Calibration file: 2GW1.CAL



vg slope of curve: 2.78
-axis intercept: 0.00
inearity: 1.00
lumber of levels: 4
D/rel SD of CF's: 1.4/66.7
=2.7772X
2: 1.0000
ast calibrated: N/A

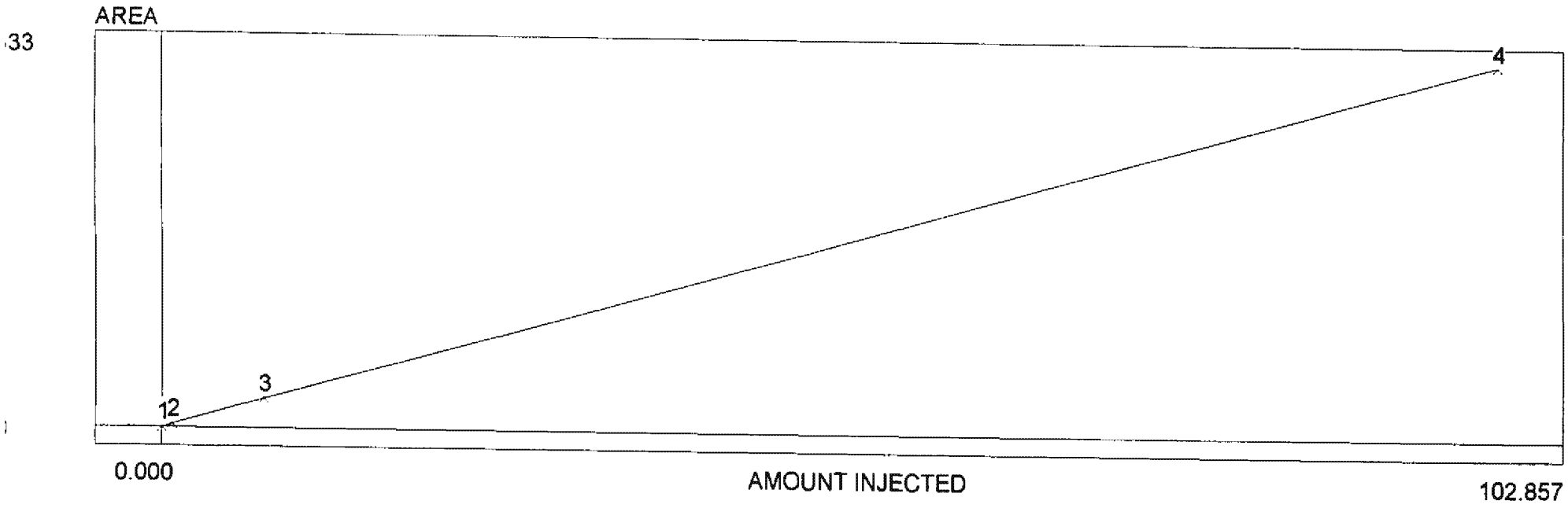
vl. Area/ht.	Amount	CF	Current	Previous #1	Previous #2
0.000	0.000	0.000	0.000	N/A	N/A
2.280	0.811	2.811	2.280	N/A	N/A
21.800	7.840	2.781	21.800	N/A	N/A
286.000	103.000	2.777	286.000	N/A	N/A

ED_002192_00004534-00028

Peak	Name	Start	End	Calibration	Int.Std	Units
	Dead Vol / Air	0.000	0.300		0.000	
	Ambient H2O	0.300	0.500		0.000	
	Ethylene Oxide	0.500	0.590	1GW1.CAL	0.000	ppm
	H2O / CO2	0.590	1.000		0.000	

ED_002192_00004534-00029

Calibration file: 1GW1.CAL

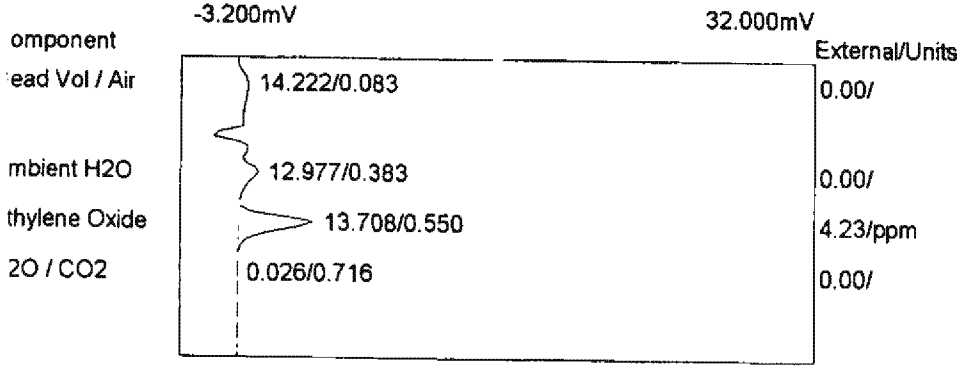


Avg slope of curve: 3.24
Y-axis intercept: 0.00
Linearity: 1.00
Number of levels: 4
SD/rel SD of CF's: 1.7/66.7
Y=3.2375X
R2: 1.0000
Last calibrated: N/A

Lvl.	Area/ht.	Amount	CF	Current	Previous #1	Previous #2
1	0.000	0.000	0.000	0.000	N/A	N/A
2	2.770	0.811	3.416	2.770	N/A	N/A
3	25.700	7.840	3.278	25.700	N/A	N/A
4	333.000	103.000	3.233	333.000	N/A	N/A

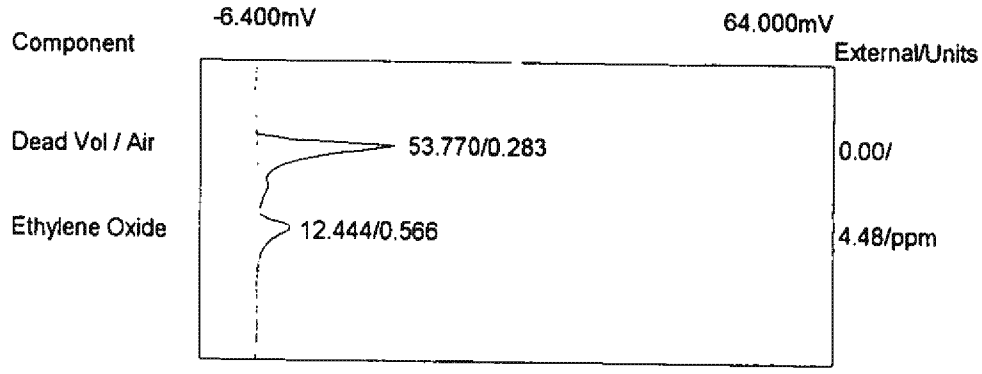
ED_002192_00004534-00030

Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 15:15:38
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-AMB.CHR (c:\peakwin)
Sample: Ambient Background
Operator: D. Kremer



Component	Retention	Area	External	Units
)ead Vol / Air	0.083	14.222	0.00	
,mbient H2O	0.383	12.977	0.00	
:thylene Oxide	0.550	13.708	4.23	ppm
I2O / CO2	0.716	0.026	0.00	
		40.933	4.23	

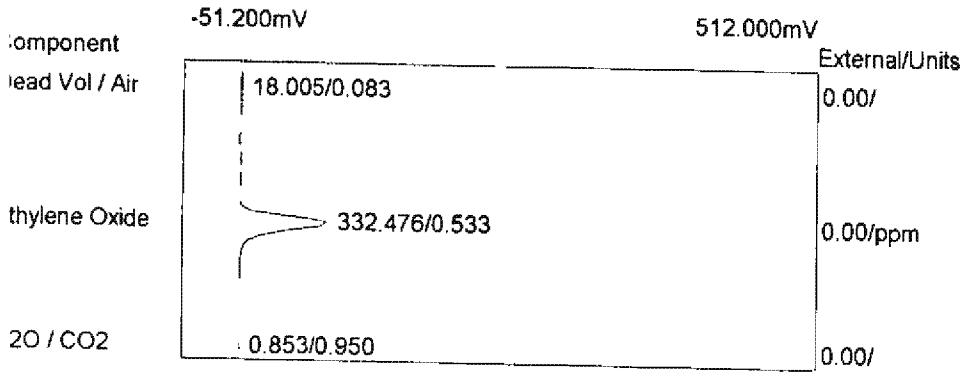
Lab name: Kremer Environmental Svcs
Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 15:15:38
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-AMB.CHR (c:\peakwin)
Sample: Ambient Background
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	53.770	0.00	
Ethylene Oxide	0.566	12.444	4.48	ppm
		66.214	4.48	

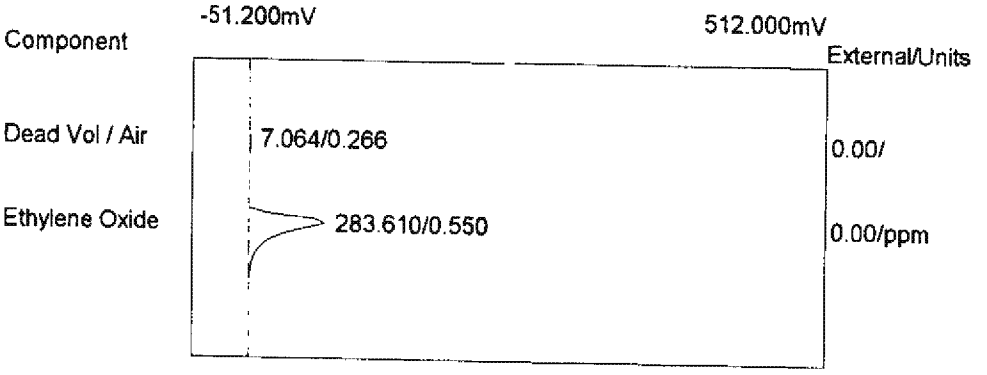
ED_002192_00004534-00031

Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 15:21:04
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-C02.CHR (c:\peakwin)
Sample: 103 ppm EtO std
Operator: D. Kremer



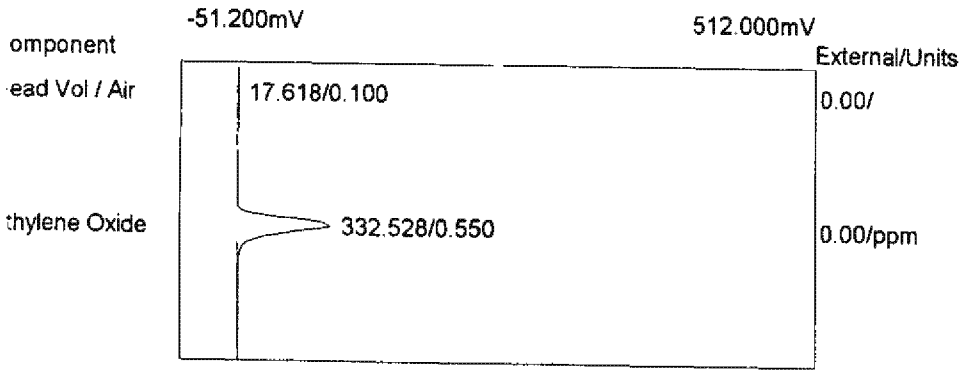
Component	Retention	Area	External	Units
ead Vol / Air	0.083	18.005	0.00	
thylene Oxide	0.533	332.476	0.00	ppm
2O / CO2	0.950	0.853	0.00	
		351.334	0.00	

Lab name: Kremer Environmental Svcs
Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 15:21:04
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-C02.CHR (c:\peakwin)
Sample: 103 ppm EtO std
Operator: D. Kremer



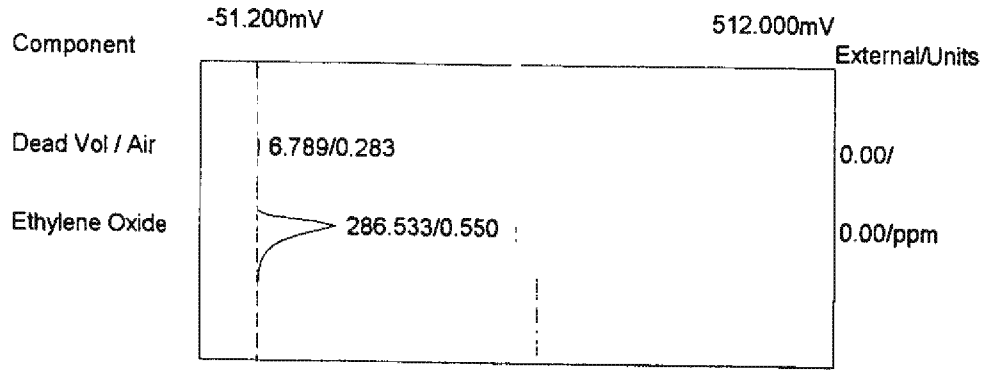
Component	Retention	Area	External	Units
Dead Vol / Air	0.266	7.064	0.00	
Ethylene Oxide	0.550	283.610	0.00	ppm
		290.674	0.00	

Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 15:22:46
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-C03.CHR (c:\peakwin)
Sample: 103 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
ead Vol / Air	0.100	17.618	0.00	
thylene Oxide	0.550	332.528	0.00	ppm
		350.146	0.00	

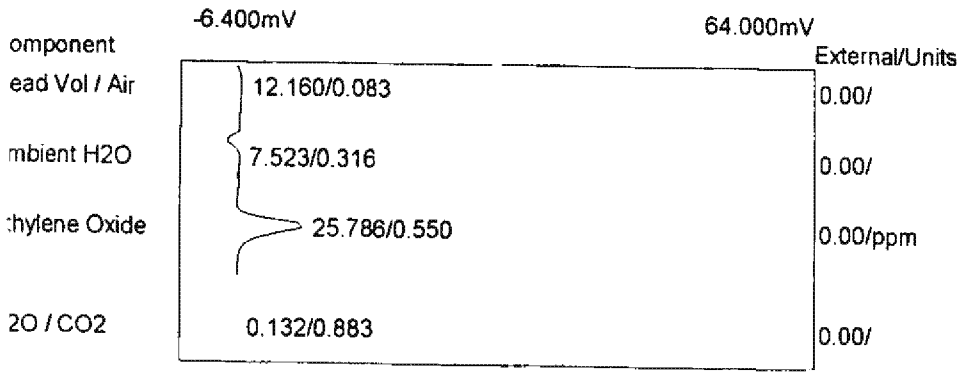
Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 15:22:46
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-C03.CHR (c:\peakwin)
Sample: 103 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	6.789	0.00	
Ethylene Oxide	0.550	286.533	0.00	ppm
		293.322	0.00	

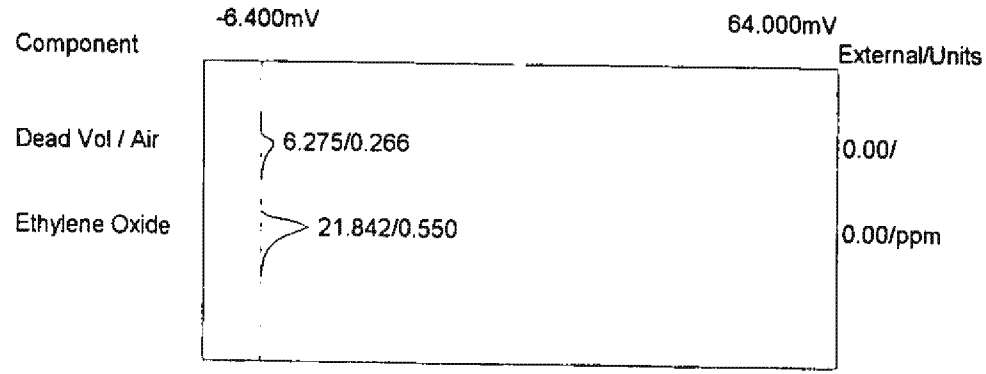
ED_002192_00004534-00033

Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 15:26:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-C04.CHR (c:\peakwin)
Sample: 7.84 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
ead Vol / Air	0.083	12.160	0.00	
mbient H2O	0.316	7.523	0.00	
thylene Oxide	0.550	25.786	0.00	ppm
2O / CO2	0.883	0.132	0.00	
		45.601	0.00	

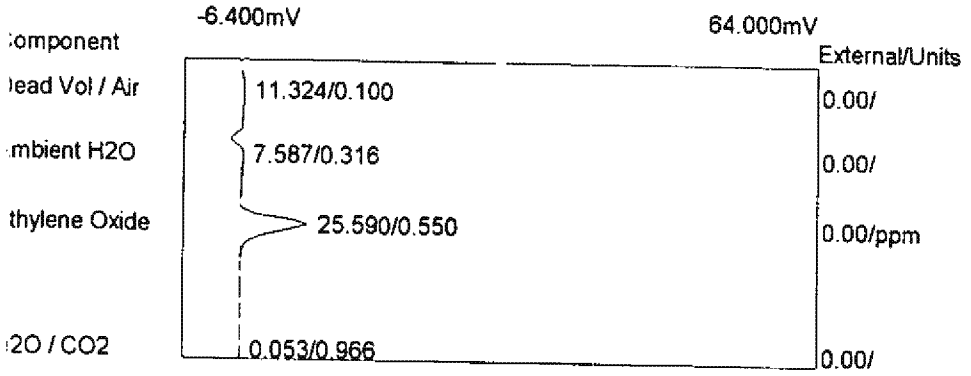
Lab name: Kremer Environmental Svcs
Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 15:26:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-C04.CHR (c:\peakwin)
Sample: 7.84 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	6.275	0.00	
Ethylene Oxide	0.550	21.842	0.00	ppm
		28.117	0.00	

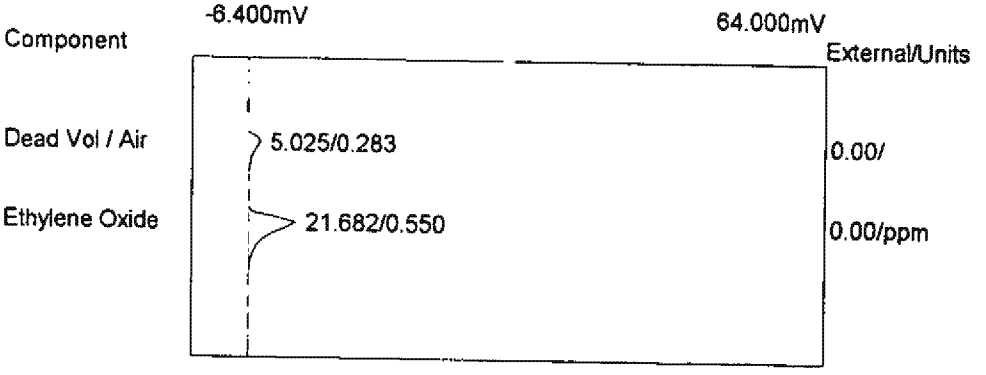
ED_002192_00004534-00034

Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 15:28:21
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-C05.CHR (c:\peakwin)
Sample: 7.84 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	11.324	0.00	
Ambient H2O	0.316	7.587	0.00	
Ethylene Oxide	0.550	25.590	0.00	ppm
H2O / CO2	0.966	0.053	0.00	
		44.554	0.00	

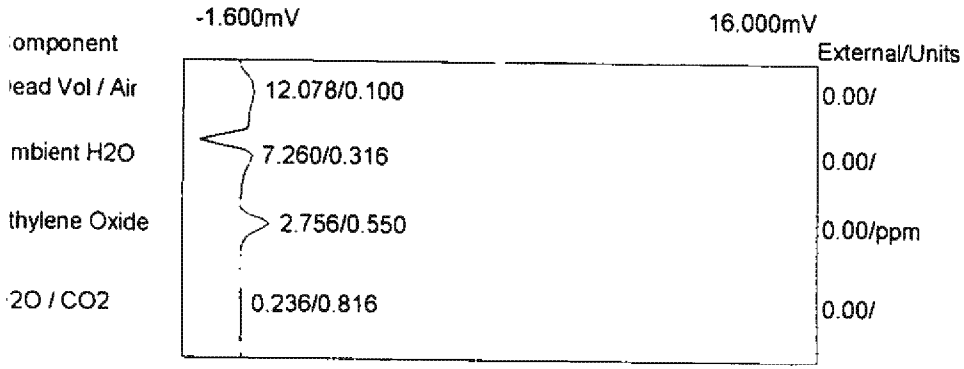
Lab name: Kremer Environmental Svcs
Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 15:28:21
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-C05.CHR (c:\peakwin)
Sample: 7.84 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	5.025	0.00	
Ethylene Oxide	0.550	21.682	0.00	ppm
		26.707	0.00	

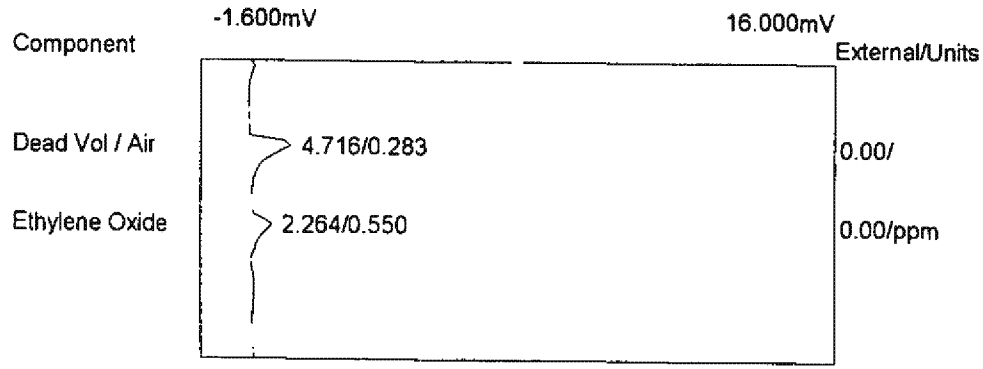
ED_002192_00004534-00035

Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 15:33:21
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-C06.CHR (c:\peakwin)
Sample: 7.84 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	12.078	0.00	
Ambient H2O	0.316	7.260	0.00	
Ethylene Oxide	0.550	2.756	0.00	ppm
H2O / CO2	0.816	0.236	0.00	
		22.330	0.00	

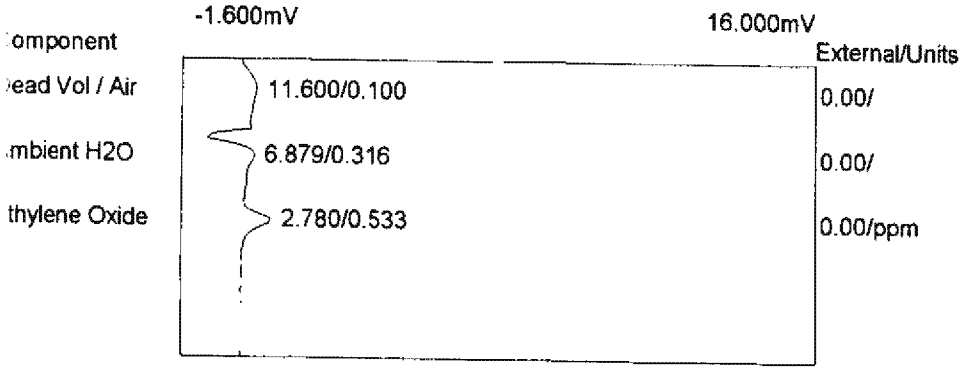
Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 15:33:21
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-C06.CHR (c:\peakwin)
Sample: 7.84 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	4.716	0.00	
Ethylene Oxide	0.550	2.264	0.00	ppm
		6.980	0.00	

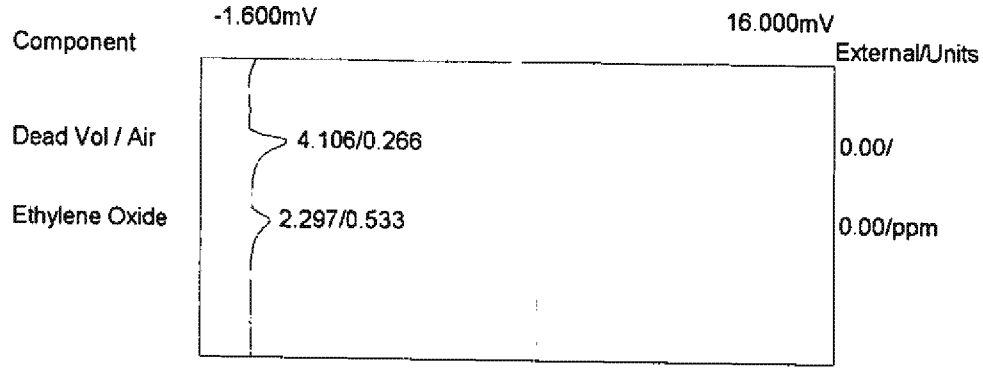
ED_002192_00004534-00036

Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 15:35:29
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-C07.CHR (c:\peakwin)
Sample: 7.84 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
ead Vol / Air	0.100	11.600	0.00	
mbient H2O	0.316	6.879	0.00	
thylene Oxide	0.533	2.780	0.00	ppm
		21.259	0.00	

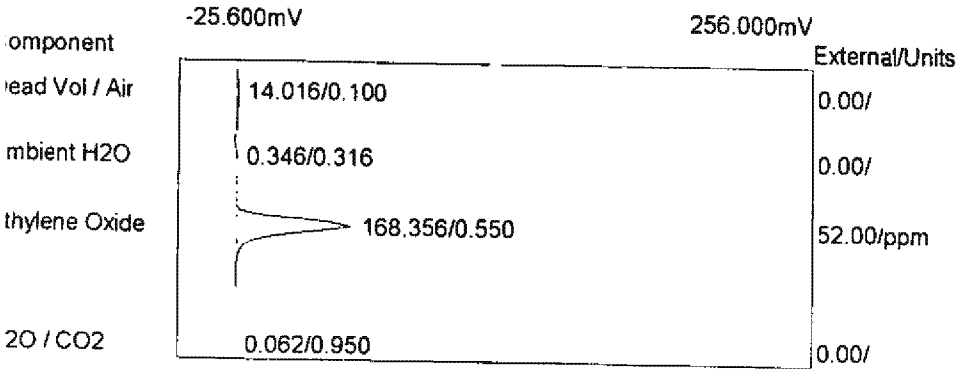
Lab name: Kremer Environmental Svcs
Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 15:35:29
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-C07.CHR (c:\peakwin)
Sample: 7.84 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	4.106	0.00	
Ethylene Oxide	0.533	2.297	0.00	ppm
		6.403	0.00	

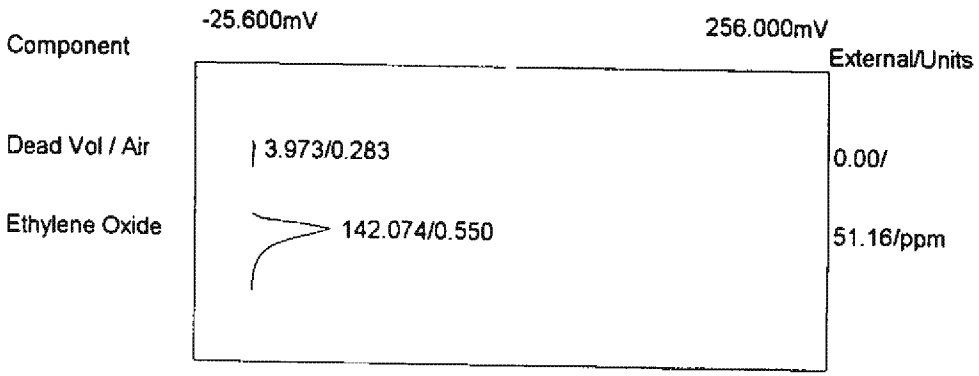
ED_002192_00004534-00037

Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 15:38:35
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-C08.CHR (c:\peakwin)
Sample: 7.84 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
ead Vol / Air	0.100	14.016	0.00	
mbient H2O	0.316	0.346	0.00	
thylene Oxide	0.550	168.356	52.00	ppm
2O / CO2	0.950	0.062	0.00	
		182.780	52.00	

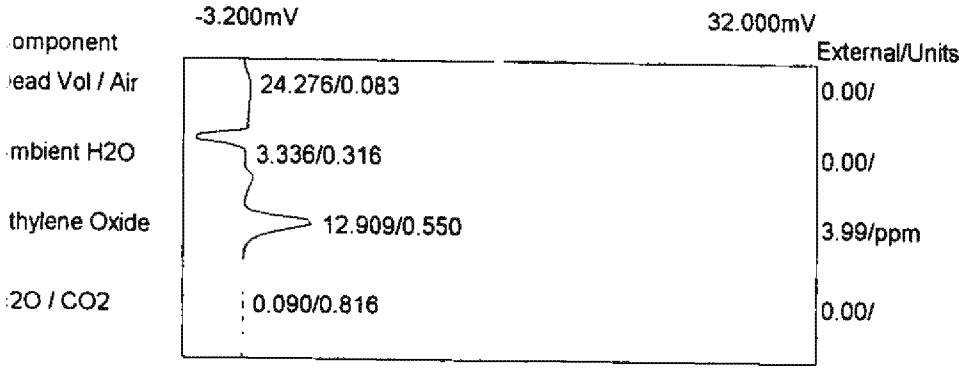
Lab name: Kremer Environmental Svcs
Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 15:38:35
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-C08.CHR (c:\peakwin)
Sample: 7.84 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	3.973	0.00	
Ethylene Oxide	0.550	142.074	51.16	ppm
		146.047	51.16	

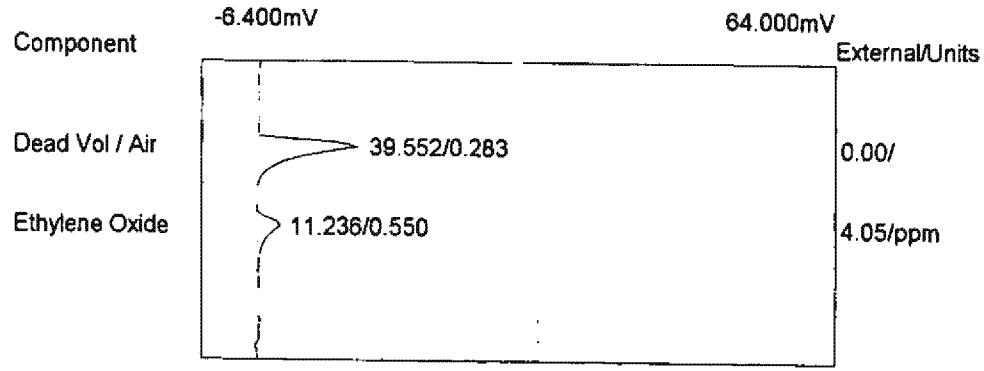
ED_002192_00004534-00038

Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 15:46:14
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-AM2.CHR (c:\peakwin)
Sample: Ambient Background
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	24.276	0.00	
Ambient H2O	0.316	3.336	0.00	
Ethylene Oxide	0.550	12.909	3.99	ppm
H2O / CO2	0.816	0.090	0.00	
		40.611	3.99	

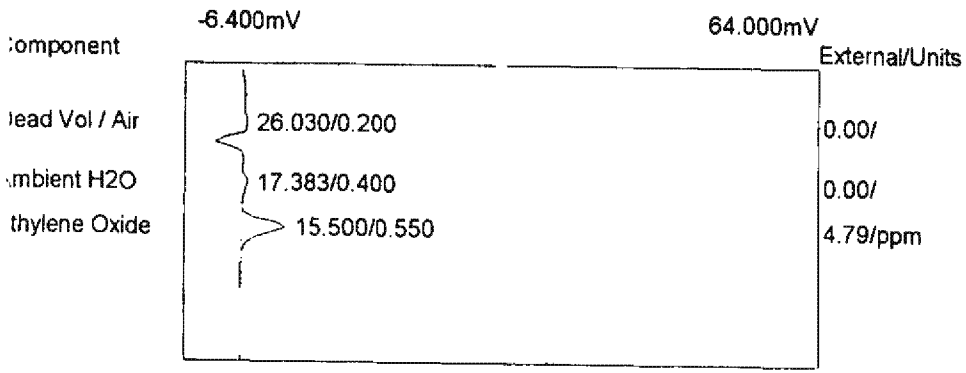
Lab name: Kremer Environmental Svcs
Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 15:46:14
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-AM2.CHR (c:\peakwin)
Sample: Ambient Background
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	39.552	0.00	
Ethylene Oxide	0.550	11.236	4.05	ppm
		50.788	4.05	

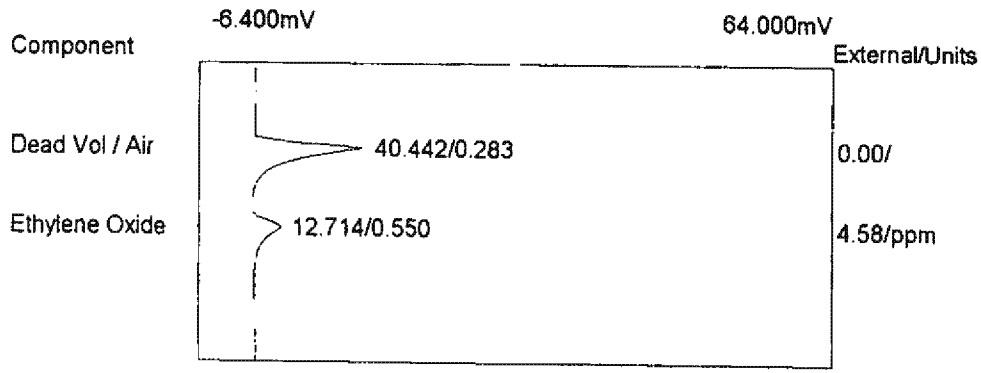
ED_002192_00004534-00039

Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 16:06:19
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-AM3.CHR (c:\peakwin)
Sample: Ambient Background
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.200	26.030	0.00	
Ambient H2O	0.400	17.383	0.00	
Ethylene Oxide	0.550	15.500	4.79	ppm
		58.913	4.79	

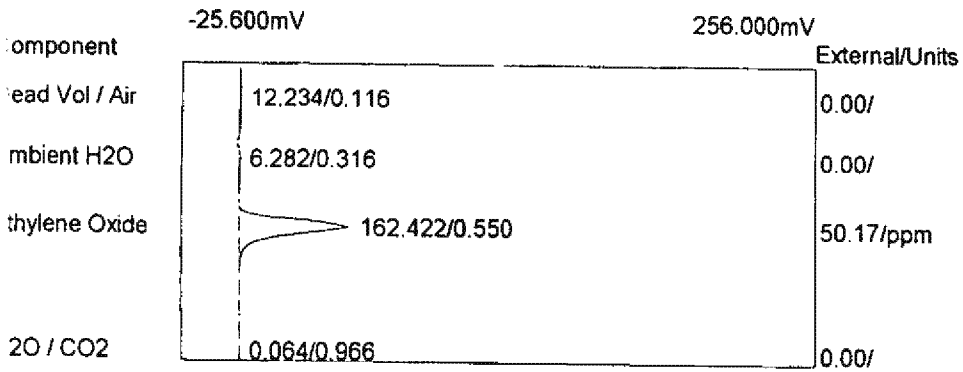
Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 16:06:19
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-AM3.CHR (c:\peakwin)
Sample: Ambient Background
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	40.442	0.00	
Ethylene Oxide	0.550	12.714	4.58	ppm
		53.156	4.58	

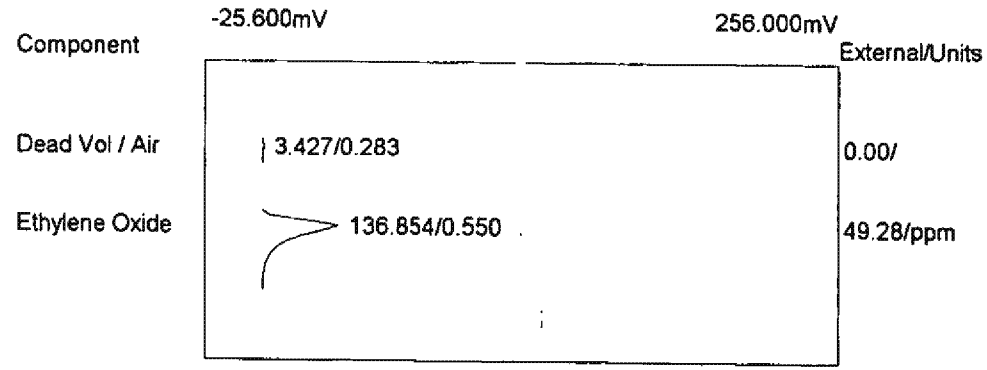
ED_002192_00004534-00040

Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 22:43:27
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-C09.CHR (c:\peakwin)
Sample: 50.3 ppm EtO audit std
Operator: D. Kremer



Component	Retention	Area	External	Units
)ead Vol / Air	0.116	12.234	0.00	
ımbient H2O	0.316	6.282	0.00	
:thylene Oxide	0.550	162.422	50.17	ppm
I2O / CO2	0.966	0.064	0.00	
		181.002	50.17	

Lab name: Kremer Environmental Svcs
Client: IBA/Griffith, Willowbrook 1
Client ID: PreCal
Analysis date: 01/23/2003 22:43:27
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-C09.CHR (c:\peakwin)
Sample: 50.3 ppm EtO audit std
Operator: D. Kremer



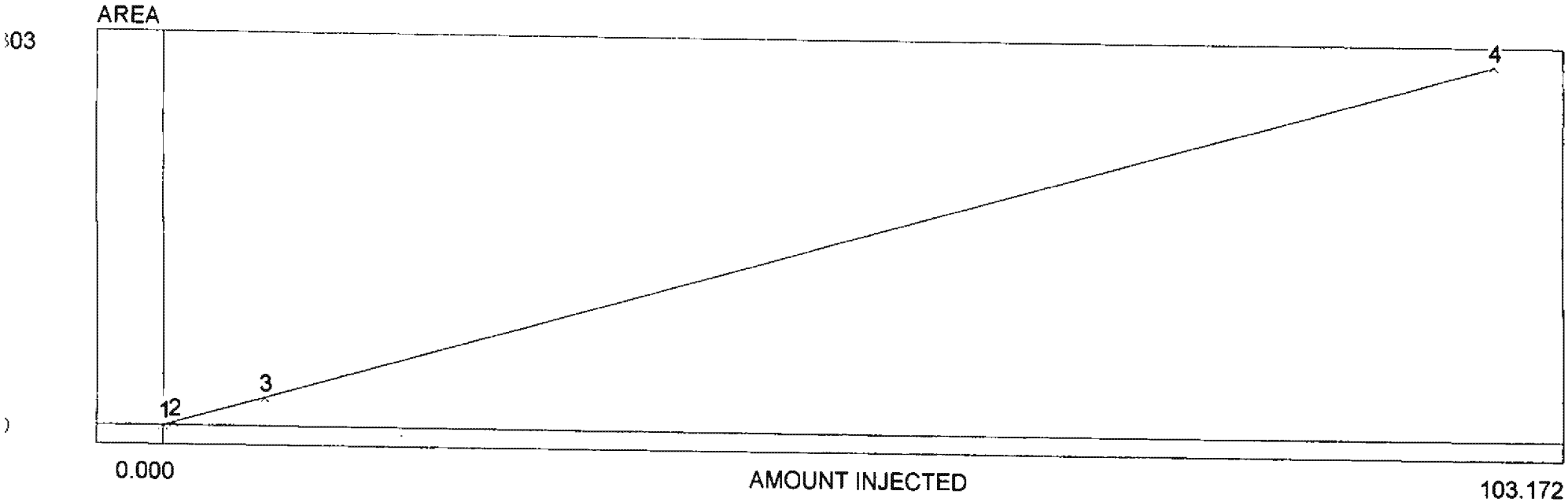
Component	Retention	Area	External	Units
Dead Vol / Air	0.283	3.427	0.00	
Ethylene Oxide	0.550	136.854	49.28	ppm
		140.281	49.28	

ED_002192_00004534-00041

Peak	Name	Start	End	Calibration	Int.Std	Units
	Dead Vol / Air	0.000	0.300		0.000	
	Ambient H2O	0.300	0.500		0.000	
	Ethylene Oxide	0.500	0.590	1GW2.CAL	0.000	ppm
	H2O / CO2	0.590	1.000		0.000	

ED_002192_00004534-00042

Calibration file: 1GW2.CAL



Avg slope of curve: 2.94
Y-axis intercept: 0.00
Linearity: 1.00
Number of levels: 4
SD/rel SD of CF's: 1.4/66.8
Y=2.9368X
R2: 1.0000
Last calibrated: N/A

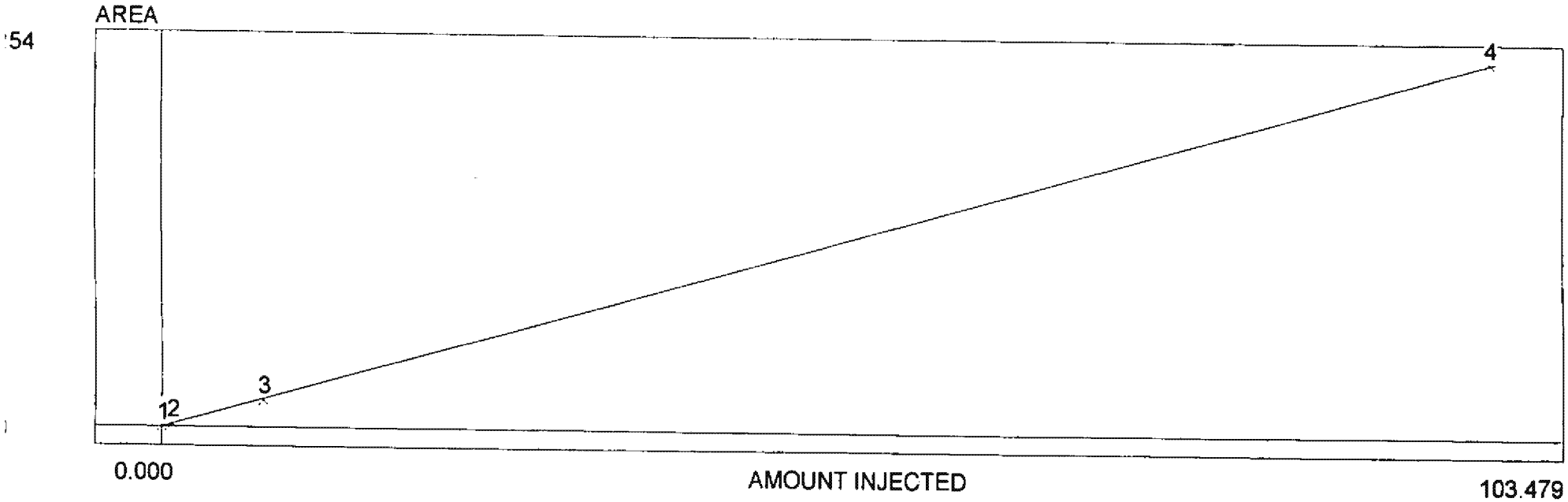
Lvl.	Area/ht.	Amount	CF	Current	Previous #1	Previous #2
1	0.000	0.000	0.000	0.000	N/A	N/A
2	2.200	0.811	2.713	2.200	N/A	N/A
3	22.700	7.840	2.895	22.700	N/A	N/A
4	303.000	103.000	2.942	303.000	N/A	N/A

ED_002192_00004534-00043

Peak	Name	Start	End	Calibration	Int.Std	Units
	Dead Vol / Air	0.000	0.300		0.000	
	Ambient H2O	0.300	0.500		0.000	
	Ethylene Oxide	0.500	0.600	2GW2.CAL	0.000	ppm
	H2O / CO2	0.600	1.000		0.000	

ED_002192_00004534-00044

Calibration file: 2GW2.CAL

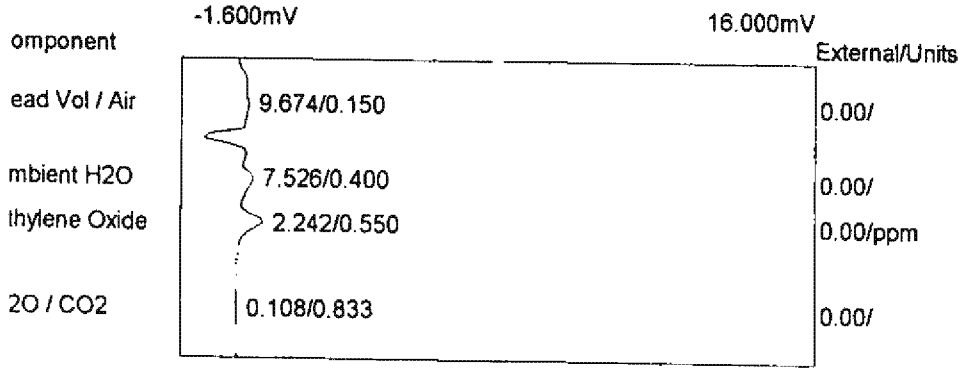


Avg slope of curve: 2.45
Y-axis intercept: 0.00
Linearity: 1.00
Number of levels: 4
SD/rel SD of CF's: 1.2/66.8
Y=2.4546X
R2: 1.0000
Last calibrated: N/A

Lvl. Area/ht.	Amount	CF	Current	Previous #1	Previous #2
0.000	0.000	0.000	0.000	N/A	N/A
1.860	0.811	2.293	1.860	N/A	N/A
18.200	7.840	2.321	18.200	N/A	N/A
254.000	103.000	2.466	254.000	N/A	N/A

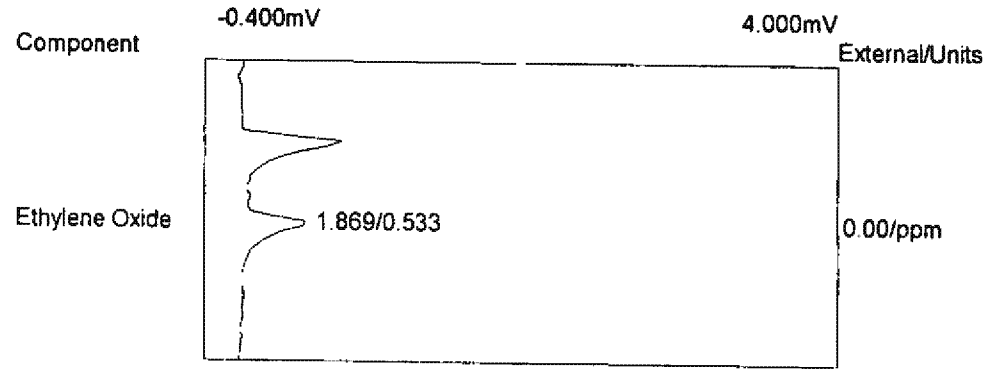
ED_002192_00004534-00045

Client: IBAGriffith-Willowbrook 2
Client ID: PreCal
Analysis date: 01/24/2003 11:04:42
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-C02.CHR (c:\peakwin)
Sample: 0.811 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
ead Vol / Air	0.150	9.674	0.00	
mbient H2O	0.400	7.526	0.00	
thylene Oxide	0.550	2.242	0.00	ppm
2O / CO2	0.833	0.108	0.00	
		19.550	0.00	

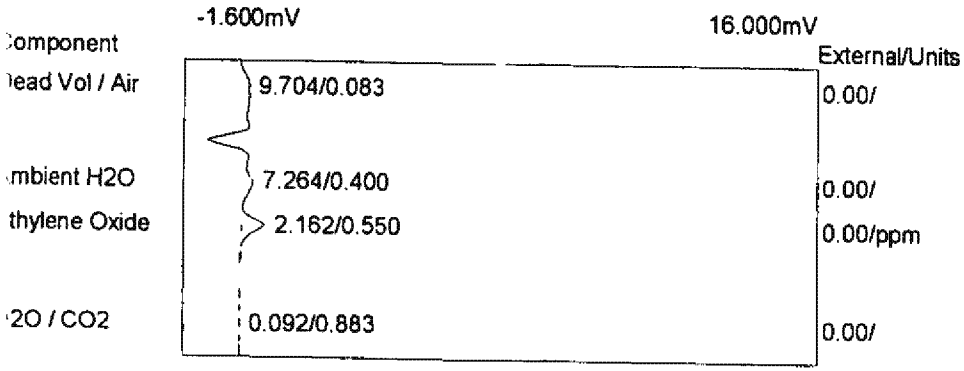
Client: IBAGriffith-Willowbrook 2
Client ID: PreCal
Analysis date: 01/24/2003 11:04:42
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-C02.CHR (c:\peakwin)
Sample: 0.811 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Ethylene Oxide	0.533	1.869	0.00	ppm
		1.869	0.00	

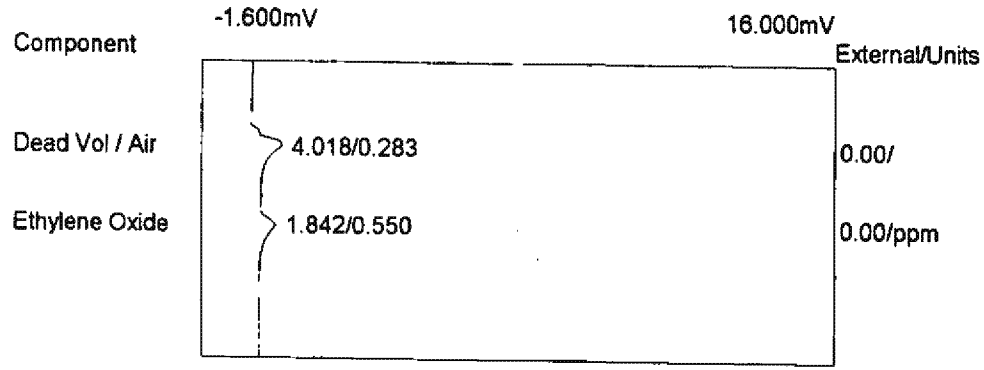
ED_002192_00004534-00046

Client: IBAGriffith-Willowbrook 2
Client ID: PreCal
Analysis date: 01/24/2003 11:07:41
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-C03.CHR (c:\peakwin)
Sample: 0.811 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	9.704	0.00	
Ambient H2O	0.400	7.264	0.00	
Ethylene Oxide	0.550	2.162	0.00	ppm
H2O / CO2	0.883	0.092	0.00	
		19.222	0.00	

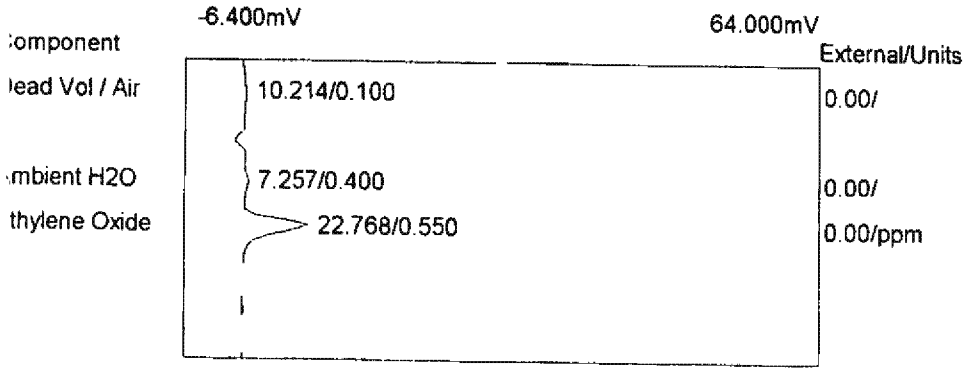
Client: IBAGriffith-Willowbrook 2
Client ID: PreCal
Analysis date: 01/24/2003 11:07:41
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-C03.CHR (c:\peakwin)
Sample: 0.811 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	4.018	0.00	
Ethylene Oxide	0.550	1.842	0.00	ppm
		5.860	0.00	

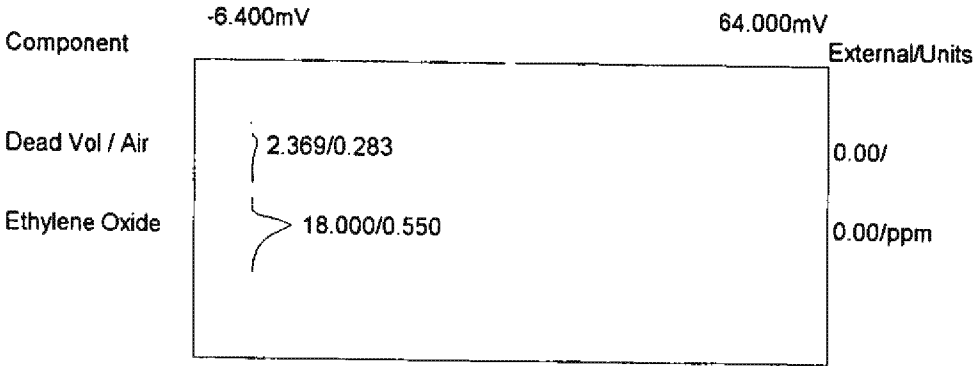
ED_002192_00004534-00047

Client: IBAGriffith-Willowbrook 2
Client ID: PreCal
Analysis date: 01/24/2003 11:11:08
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-C04.CHR (c:\peakwin)
Sample: 7.84 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	10.214	0.00	
Ambient H2O	0.400	7.257	0.00	
Ethylene Oxide	0.550	22.768	0.00	ppm
		40.239	0.00	

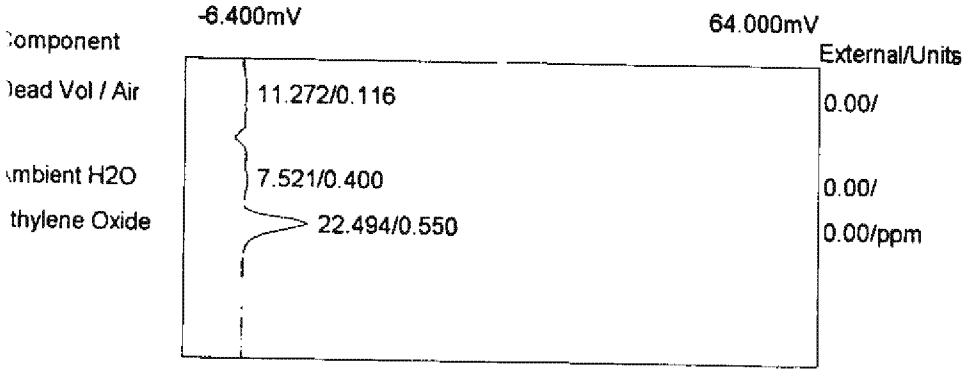
Client: IBAGriffith-Willowbrook 2
Client ID: PreCal
Analysis date: 01/24/2003 11:11:08
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-C04.CHR (c:\peakwin)
Sample: 7.84 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	2.369	0.00	
Ethylene Oxide	0.550	18.000	0.00	ppm
		20.369	0.00	

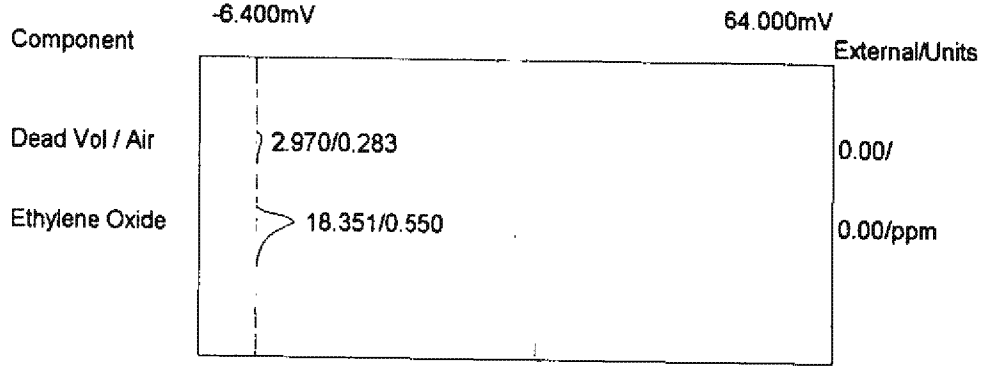
ED_002192_00004534-00048

Client: IBA/Griffith-Willowbrook 2
Client ID: PreCal
Analysis date: 01/24/2003 11:13:52
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-C05.CHR (c:\peakwin)
Sample: 7.84 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.116	11.272	0.00	
Ambient H2O	0.400	7.521	0.00	
Ethylene Oxide	0.550	22.494	0.00	ppm
		41.287	0.00	

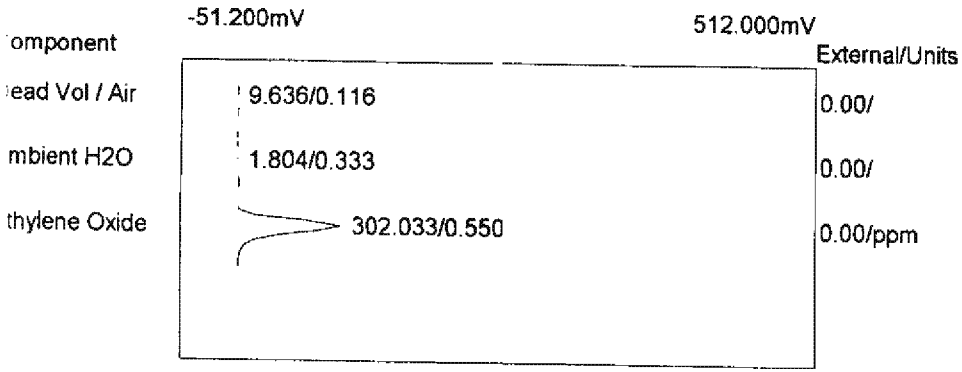
Client: IBAGriffith-Willowbrook 2
Client ID: PreCal
Analysis date: 01/24/2003 11:13:52
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-C05.CHR (c:\peakwin)
Sample: 7.84 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	2.970	0.00	
Ethylene Oxide	0.550	18.351	0.00	ppm
		21.321	0.00	

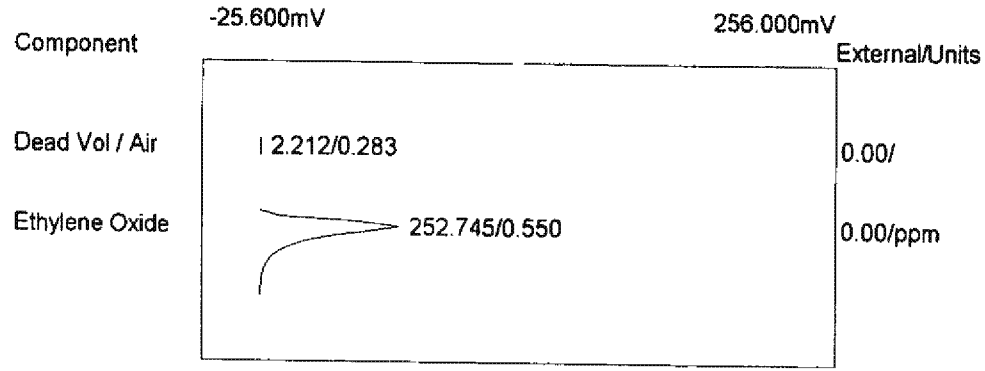
ED_002192_00004534-00049

Client: IBA/Griffith-Willowbrook 2
Client ID: PreCal
Analysis date: 01/24/2003 11:16:16
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-C06.CHR (c:\peakwin)
Sample: 103 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
ead Vol / Air	0.116	9.636	0.00	
mbient H2O	0.333	1.804	0.00	
thylene Oxide	0.550	302.033	0.00	ppm
		313.473	0.00	

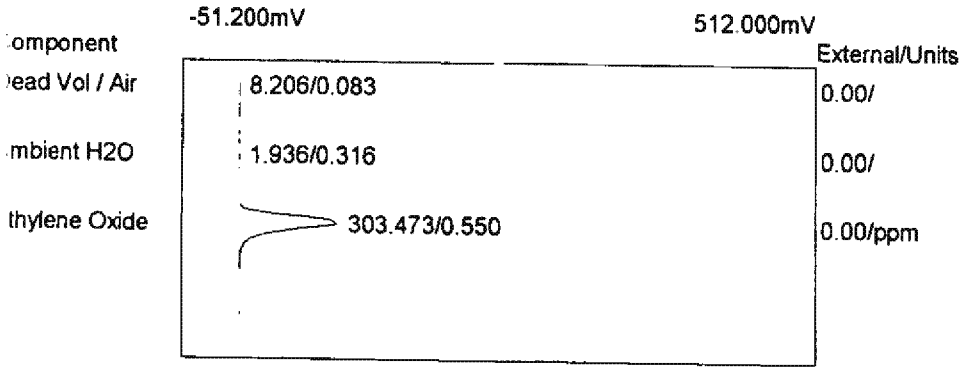
Client: IBAGriffith-Willowbrook 2
Client ID: PreCal
Analysis date: 01/24/2003 11:16:16
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-C06.CHR (c:\peakwin)
Sample: 103 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	2.212	0.00	
Ethylene Oxide	0.550	252.745	0.00	ppm
		254.957	0.00	

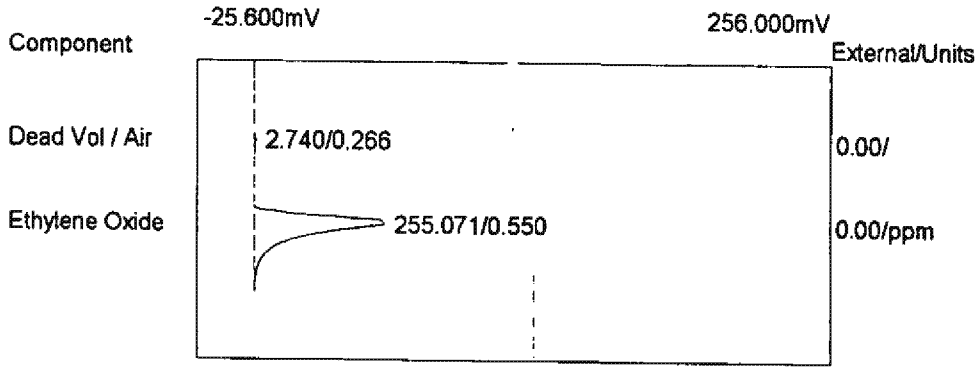
ED_002192_00004534-00050

Client: IBA/Griffith-Willowbrook 2
Client ID: PreCal
Analysis date: 01/24/2003 11:20:05
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-C07.CHR (c:\peakwin)
Sample: 103 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
ead Vol / Air	0.083	8.206	0.00	
mbient H2O	0.316	1.936	0.00	
thylene Oxide	0.550	303.473	0.00	ppm
		313.615	0.00	

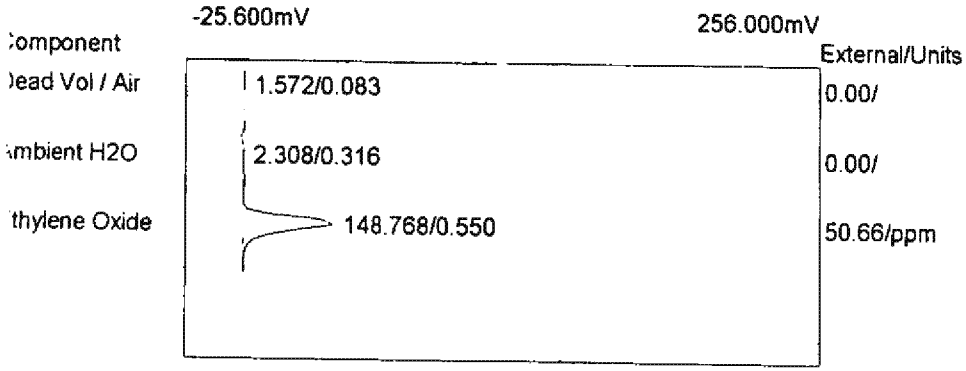
Client: IBAGriffith-Willowbrook 2
Client ID: PreCal
Analysis date: 01/24/2003 11:20:05
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-C07.CHR (c:\peakwin)
Sample: 103 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	2.740	0.00	
Ethylene Oxide	0.550	255.071	0.00	ppm
		257.811	0.00	

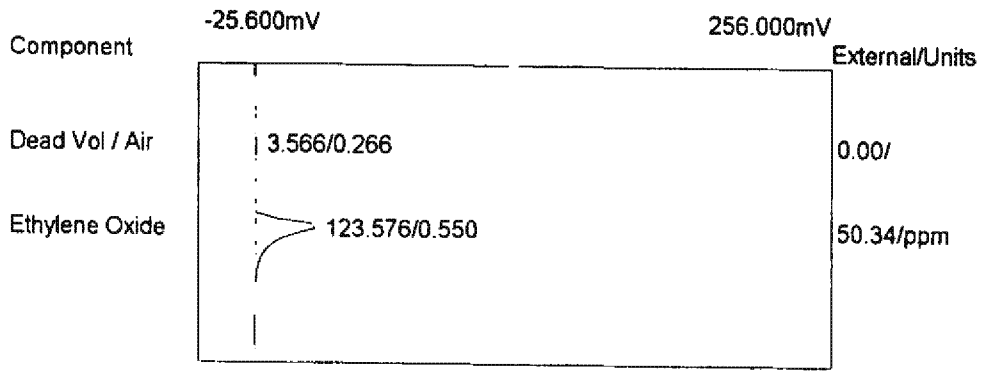
ED_002192_00004534-00051

Client: IBAGriffith-Willowbrook 2
Client ID: PreCal
Analysis date: 01/24/2003 11:22:18
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-C08.CHR (c:\peakwin)
Sample: 50.3ppm EtO audit std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	1.572	0.00	
Ambient H2O	0.316	2.308	0.00	
Ethylene Oxide	0.550	148.768	50.66	ppm
		152.648	50.66	

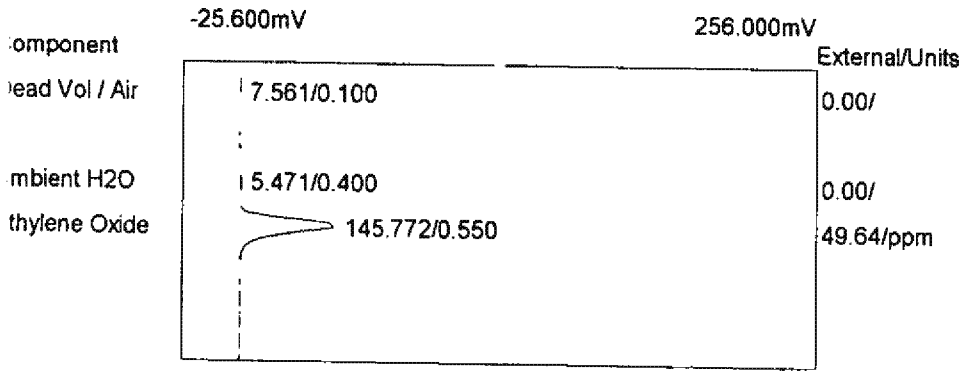
Client: IBAGriffith-Willowbrook 2
Client ID: PreCal
Analysis date: 01/24/2003 11:22:18
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-C08.CHR (c:\peakwin)
Sample: 50.3 ppm EtO audit std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	3.566	0.00	
Ethylene Oxide	0.550	123.576	50.34	ppm
		127.142	50.34	

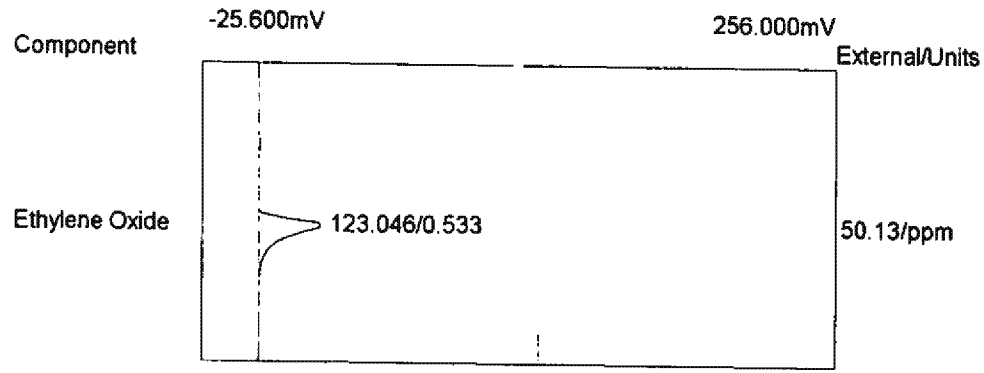
ED_002192_00004534-00052

Client: IBA/Griffith-Willowbrook 2
Client ID: PostCal
Analysis date: 01/24/2003 18:28:58
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-C09.CHR (c:\peakwin)
Sample: 50.3ppm EtO audit std
Operator: D. Kremer



Component	Retention	Area	External	Units
ead Vol / Air	0.100	7.561	0.00	
mbient H2O	0.400	5.471	0.00	
thylene Oxide	0.550	145.772	49.64	ppm
		158.804	49.64	

Client: IBAGriffith-Willowbrook 2
Client ID: PostCal
Analysis date: 01/24/2003 18:28:58
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-C09.CHR (c:\peakwin)
Sample: 50.3 ppm EtO audit std
Operator: D. Kremer



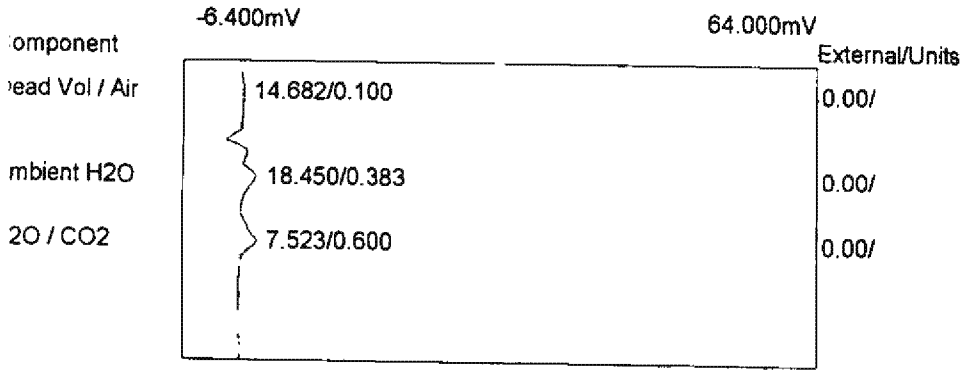
Component	Retention	Area	External	Units
Ethylene Oxide	0.533	123.046	50.13	ppm
		123.046	50.13	

ED_002192_00004534-00053

APPENDIX B

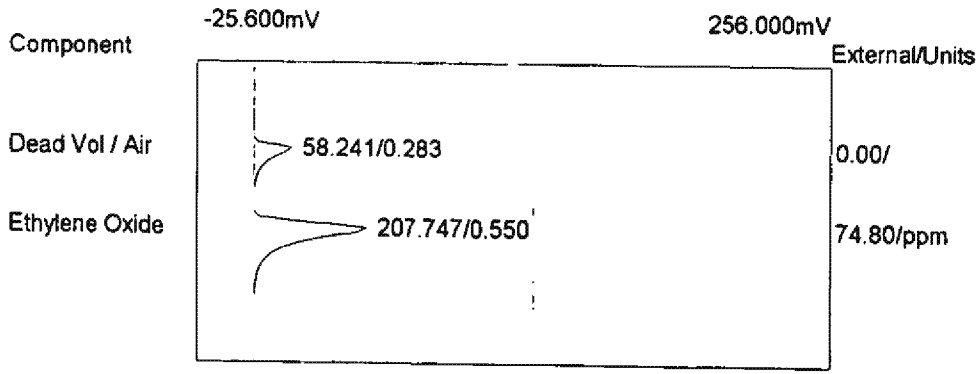
Plant 1 - Run #1 - Aeration Chromatograms - SC1 & SC2

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:13:03
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-A01.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	14.682	0.00	
Ambient H2O	0.383	18.450	0.00	
H2O / CO2	0.600	7.523	0.00	
		40.655	0.00	

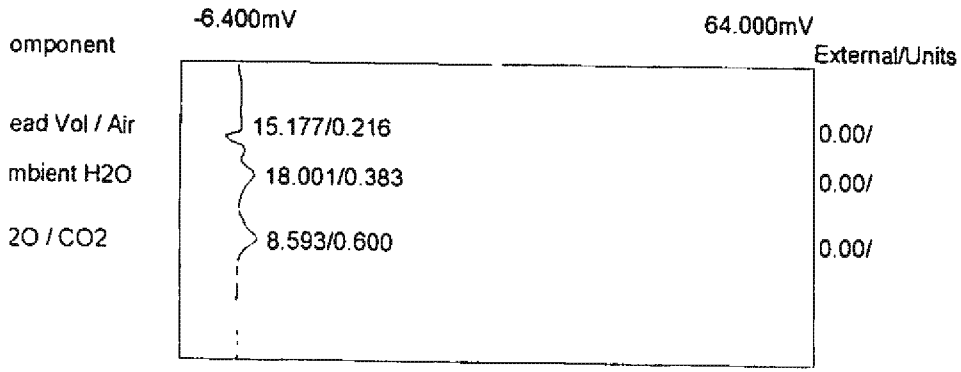
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:13:03
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-A01.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	58.241	0.00	
Ethylene Oxide	0.550	207.747	74.80	ppm
		265.988	74.80	

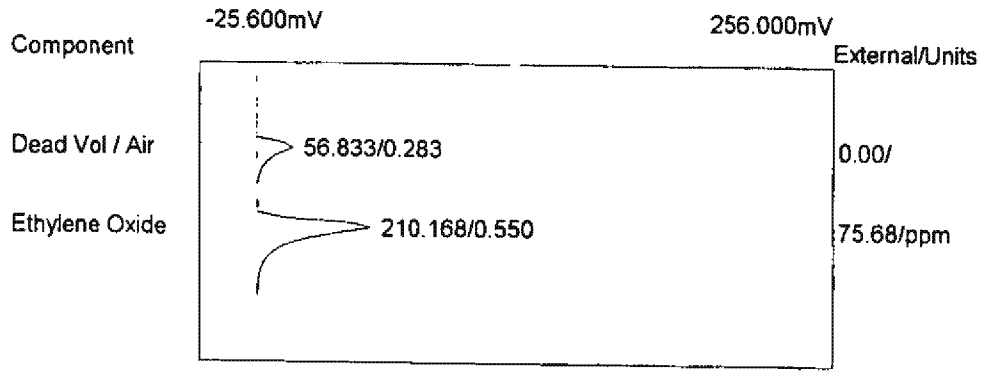
ED_002192_00004534-00055

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:18:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-A02.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ead Vol / Air	0.216	15.177	0.00	
mbient H2O	0.383	18.001	0.00	
2O / CO2	0.600	8.593	0.00	
		41.771	0.00	

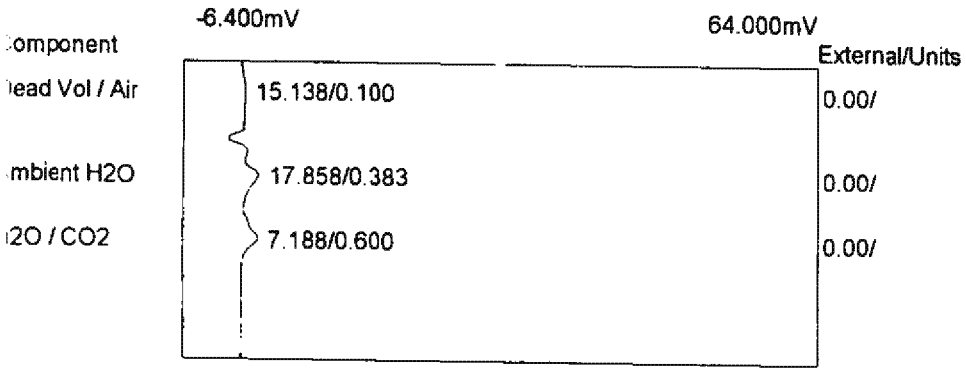
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:18:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-A02.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	56.833	0.00	
Ethylene Oxide	0.550	210.168	75.68	ppm
		267.001	75.68	

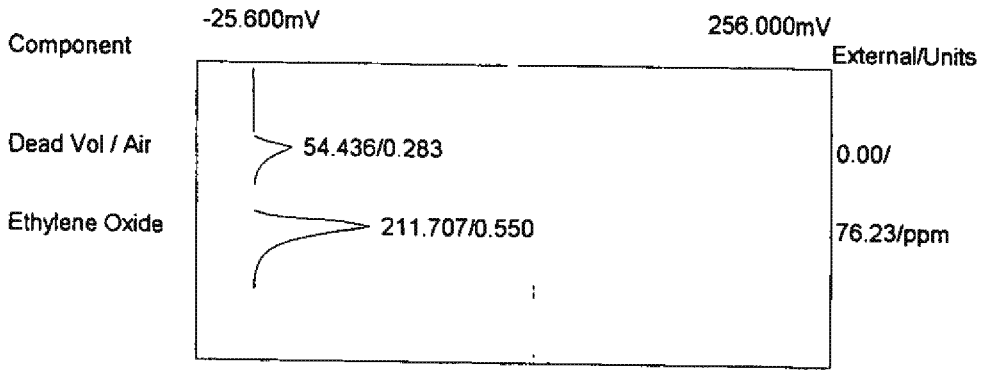
ED_002192_00004534-00056

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:23:26
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-A03.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	15.138	0.00	
Ambient H2O	0.383	17.858	0.00	
H2O / CO2	0.600	7.188	0.00	
		40.184	0.00	

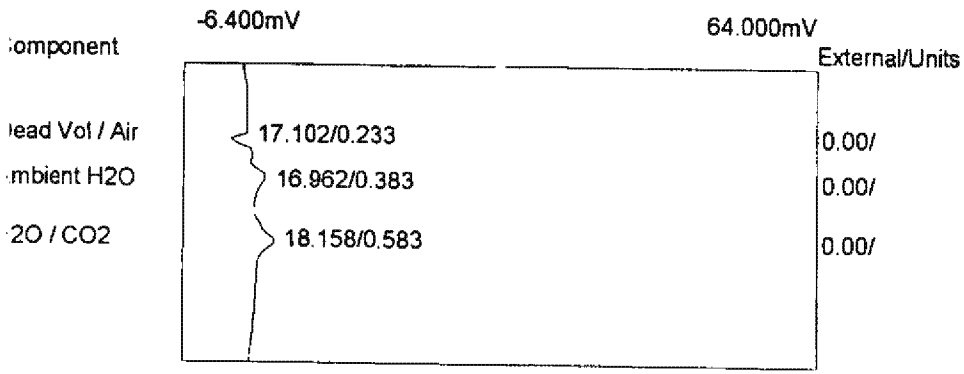
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:23:26
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-A03.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	54.436	0.00	
Ethylene Oxide	0.550	211.707	76.23	ppm
		266.143	76.23	

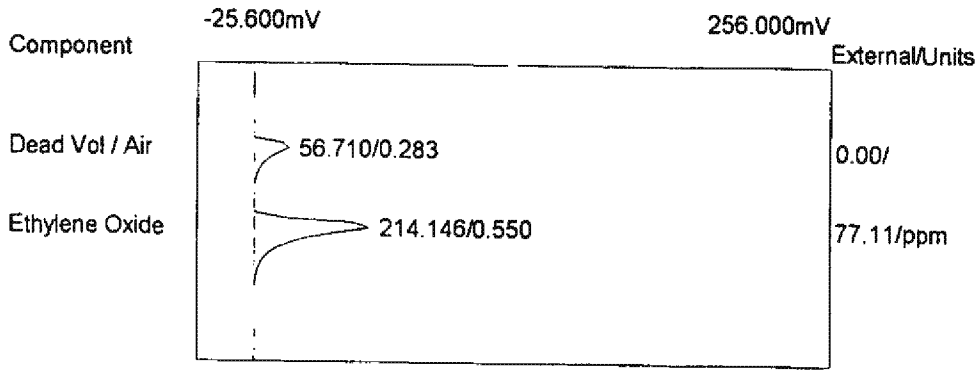
ED_002192_00004534-00057

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:29:42
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-A04.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	17.102	0.00	
Ambient H2O	0.383	16.962	0.00	
H2O / CO2	0.583	18.158	0.00	
		52.222	0.00	

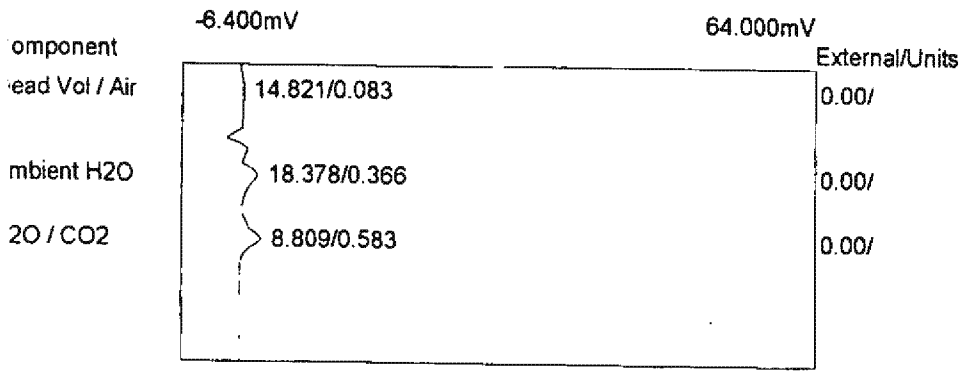
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:29:42
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-A04.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	56.710	0.00	
Ethylene Oxide	0.550	214.146	77.11	ppm
		270.856	77.11	

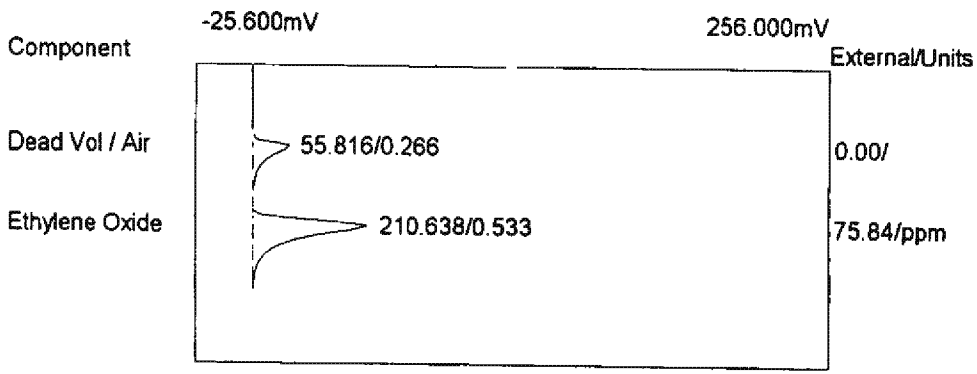
ED_002192_00004534-00058

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:33:25
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-A05.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
)ead Vol / Air	0.083	14.821	0.00	
ımbient H2O	0.366	18.378	0.00	
‡2O / CO2	0.583	8.809	0.00	
		42.008	0.00	

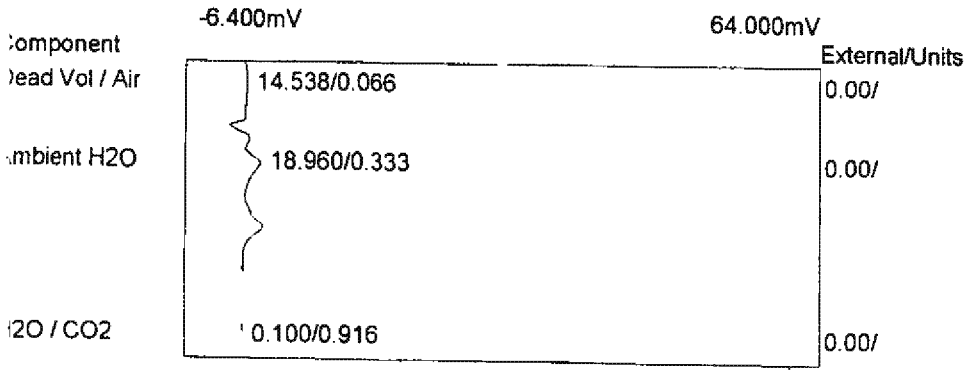
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:33:25
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-A05.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	55.816	0.00	
Ethylene Oxide	0.533	210.638	75.84	ppm
		266.454	75.84	

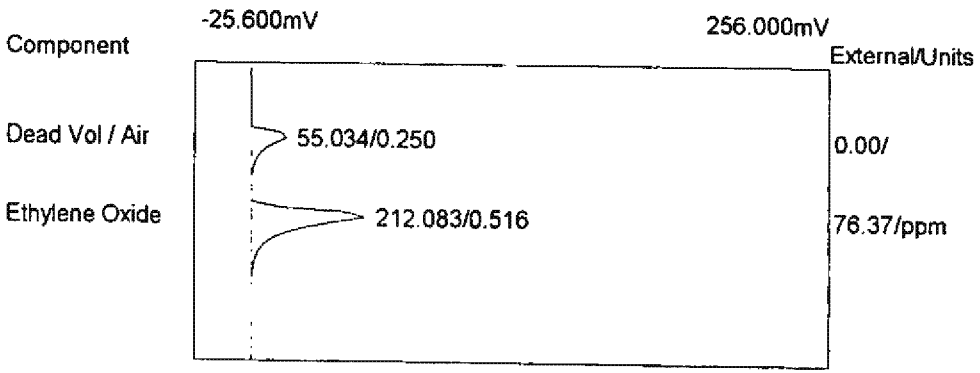
ED_002192_00004534-00059

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:38:04
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-A06.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.066	14.538	0.00	
Ambient H2O	0.333	18.960	0.00	
H2O / CO2	0.916	0.100	0.00	
		33.598	0.00	

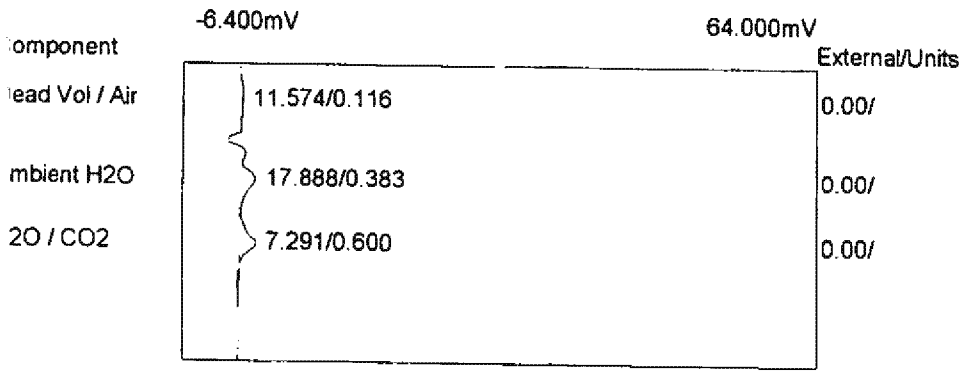
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:38:04
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-A06.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.250	55.034	0.00	
Ethylene Oxide	0.516	212.083	76.37	ppm
		267.117	76.37	

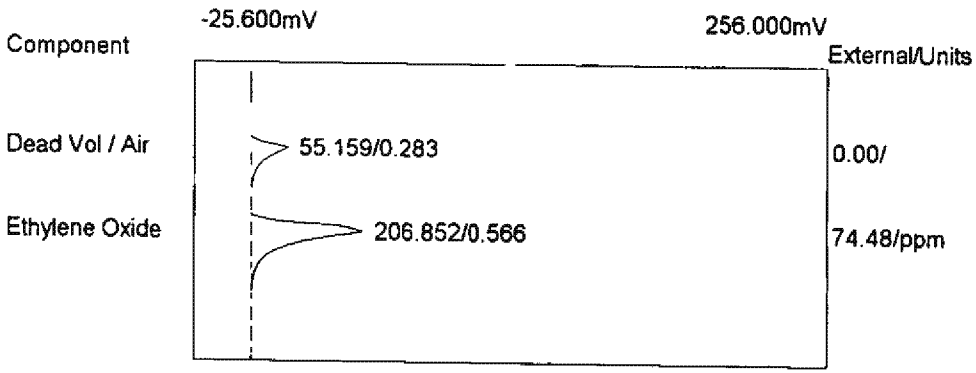
ED_002192_00004534-00060

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:43:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-A07.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
)ead Vol / Air	0.116	11.574	0.00	
\mbient H2O	0.383	17.888	0.00	
I2O / CO2	0.600	7.291	0.00	
		36.753	0.00	

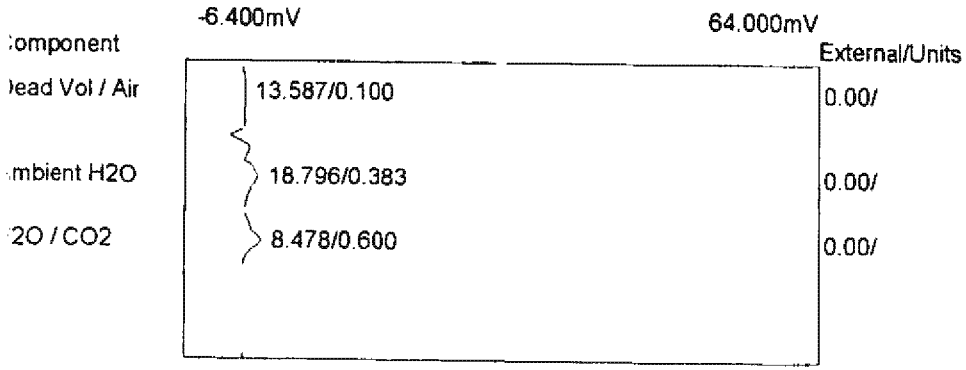
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:43:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-A07.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	55.159	0.00	
Ethylene Oxide	0.566	206.852	74.48	ppm
		262.011	74.48	

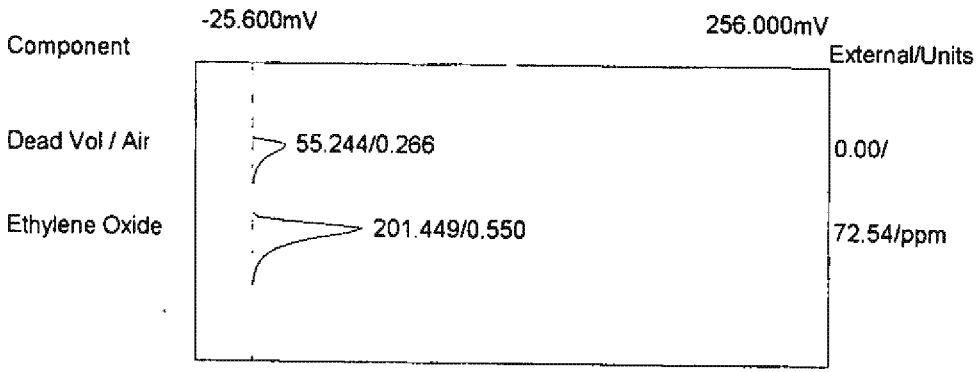
ED_002192_00004534-00061

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:48:43
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-A08.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	13.587	0.00	
Ambient H2O	0.383	18.796	0.00	
H2O / CO2	0.600	8.478	0.00	
		40.861	0.00	

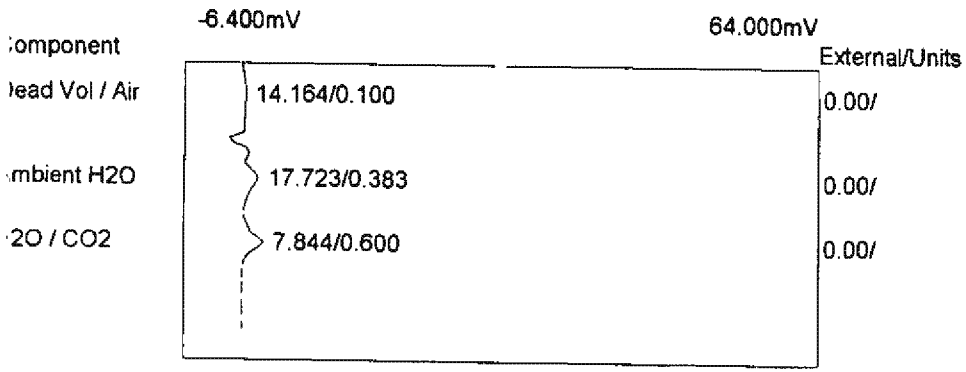
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:48:43
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-A08.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	55.244	0.00	
Ethylene Oxide	0.550	201.449	72.54	ppm
		256.693	72.54	

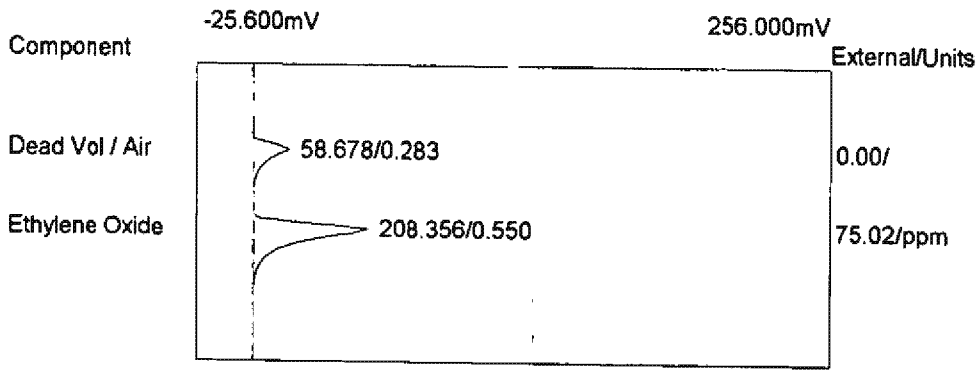
ED_002192_00004534-00062

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:54:12
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-A09.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ead Vol / Air	0.100	14.164	0.00	
mbient H2O	0.383	17.723	0.00	
2O / CO2	0.600	7.844	0.00	
		39.731	0.00	

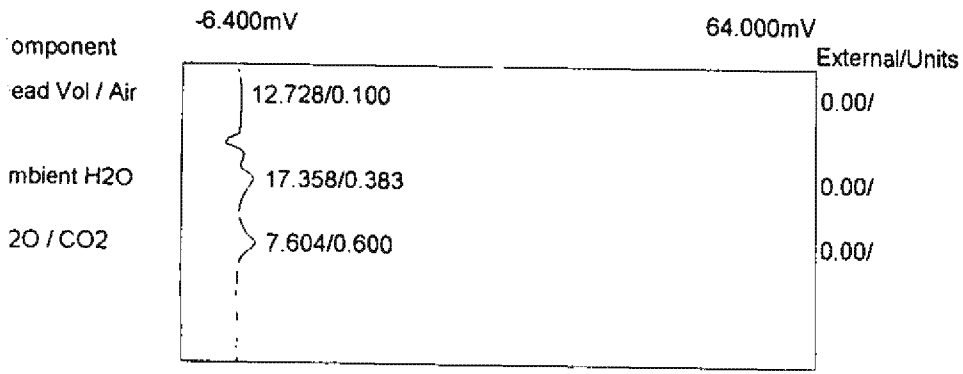
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:54:12
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-A09.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	58.678	0.00	
Ethylene Oxide	0.550	208.356	75.02	ppm
		267.034	75.02	

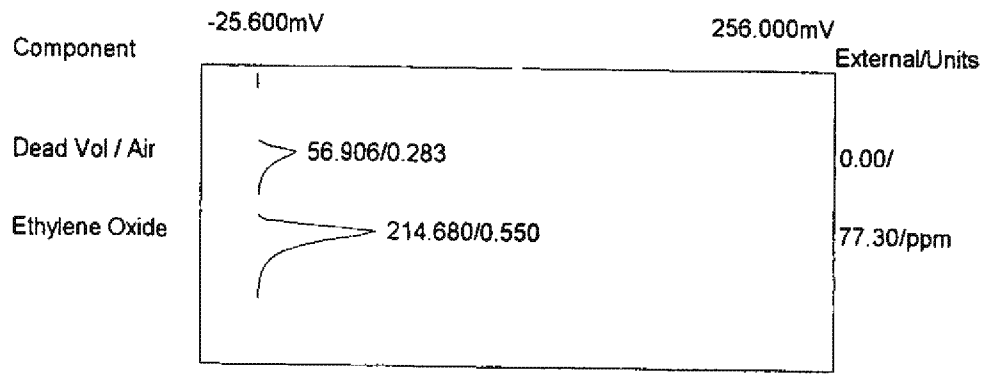
ED_002192_00004534-00063

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:58:06
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-A10.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ead Vol / Air	0.100	12.728	0.00	
mbient H2O	0.383	17.358	0.00	
2O / CO2	0.600	7.604	0.00	
		37.690	0.00	

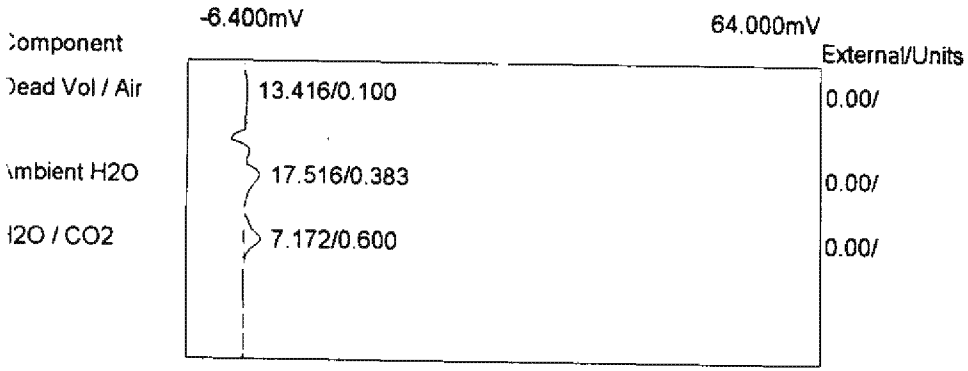
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 16:58:06
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-A10.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	56.906	0.00	
Ethylene Oxide	0.550	214.680	77.30	ppm
		271.586	77.30	

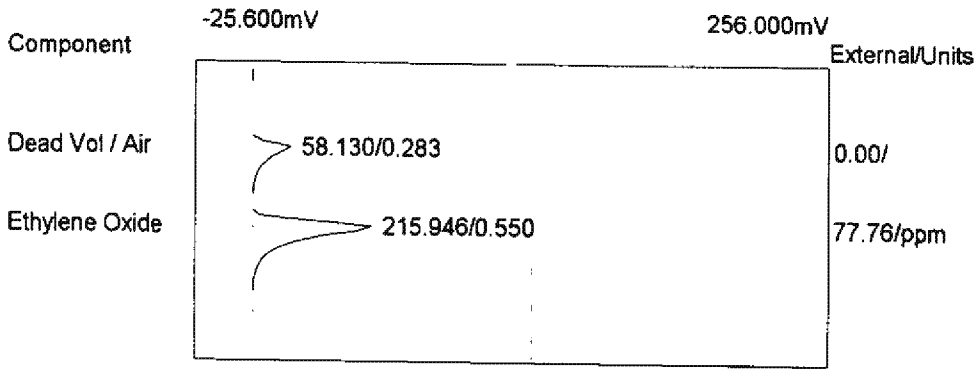
ED_002192_00004534-00064

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 17:03:20
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-A11.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	13.416	0.00	
Ambient H2O	0.383	17.516	0.00	
H2O / CO2	0.600	7.172	0.00	
		38.104	0.00	

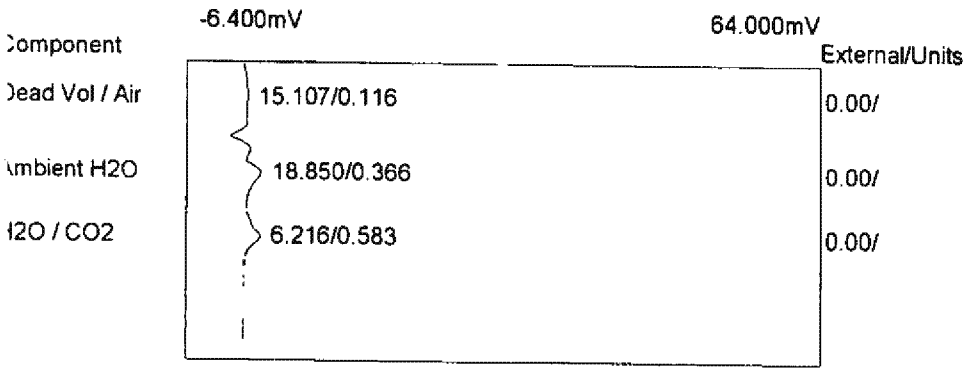
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 17:03:20
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-A11.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	58.130	0.00	
Ethylene Oxide	0.550	215.946	77.76	ppm
		274.076	77.76	

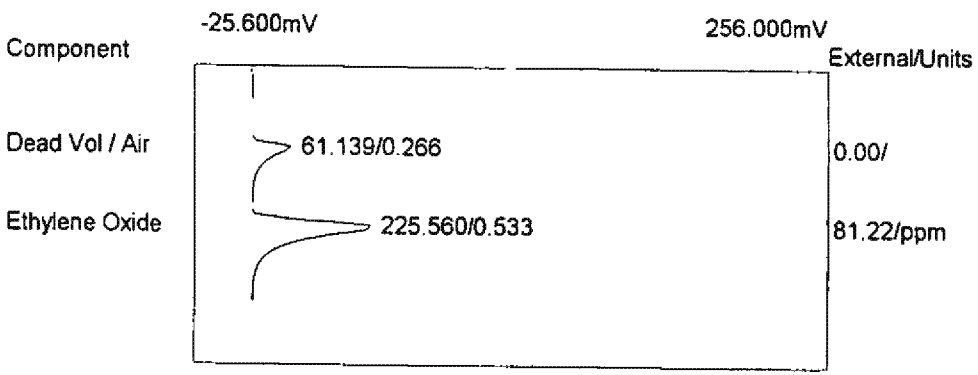
ED_002192_00004534-00065

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 17:08:02
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW1-A12.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.116	15.107	0.00	
Ambient H2O	0.366	18.850	0.00	
H2O / CO2	0.583	6.216	0.00	
		40.173	0.00	

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#1Aer
Analysis date: 01/23/2003 17:08:02
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW1-A12.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



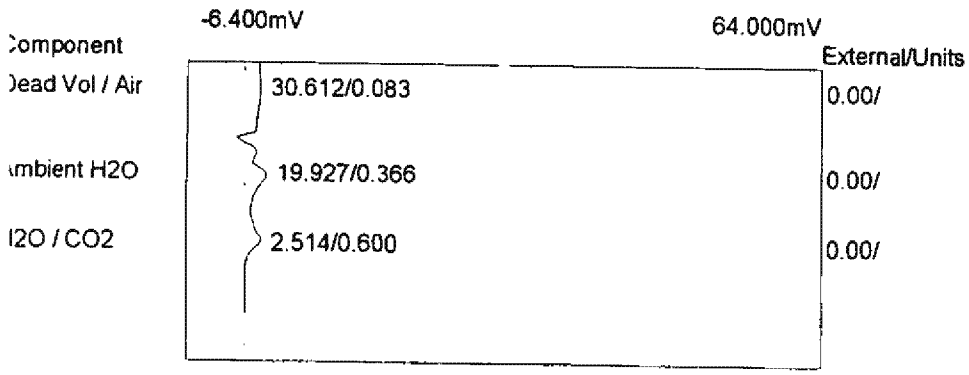
Component	Retention	Area	External	Units
Dead Vol / Air	0.266	61.139	0.00	
Ethylene Oxide	0.533	225.560	81.22	ppm
		286.699	81.22	

ED_002192_00004534-00066

APPENDIX C

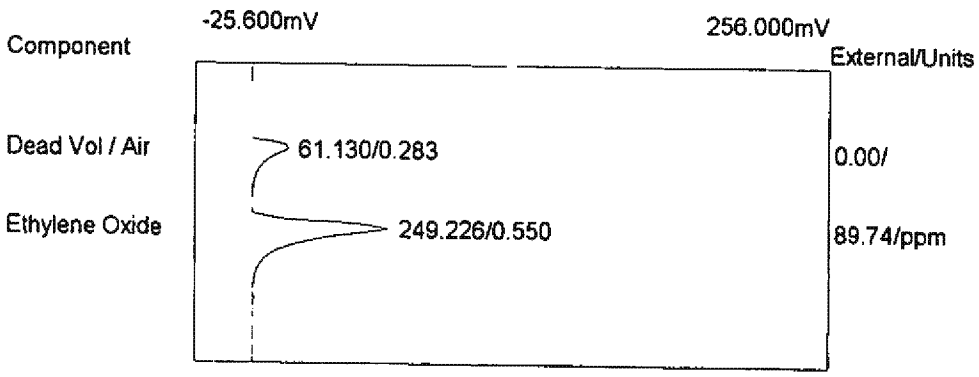
Plant 1 - Run #2 - Aeration Chromatograms - SC1 & SC2

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:15:13
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW2-A01.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	30.612	0.00	
Ambient H2O	0.366	19.927	0.00	
H2O / CO2	0.600	2.514	0.00	
		53.053	0.00	

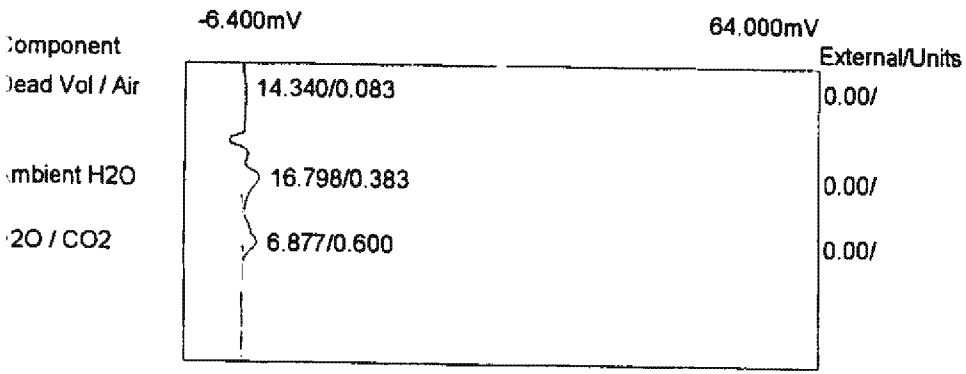
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:15:13
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW2-A01.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	61.130	0.00	
Ethylene Oxide	0.550	249.226	89.74	ppm
		310.356	89.74	

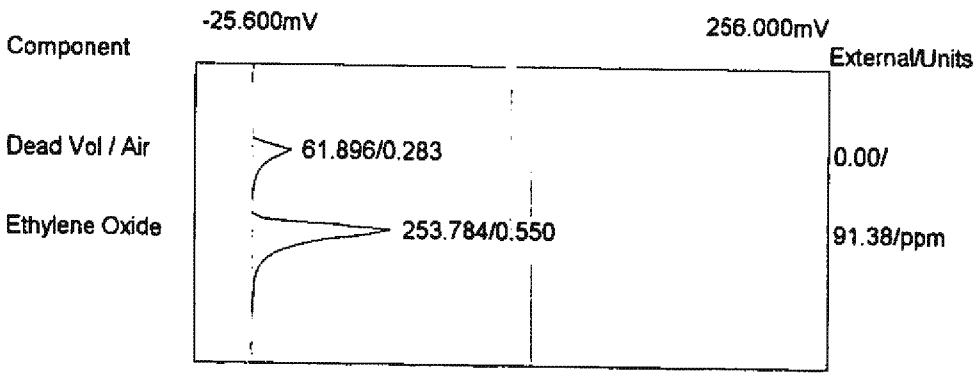
ED_002192_00004534-00068

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:18:03
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW2-A02.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	14.340	0.00	
Ambient H2O	0.383	16.798	0.00	
H2O / CO2	0.600	6.877	0.00	
		38.015	0.00	

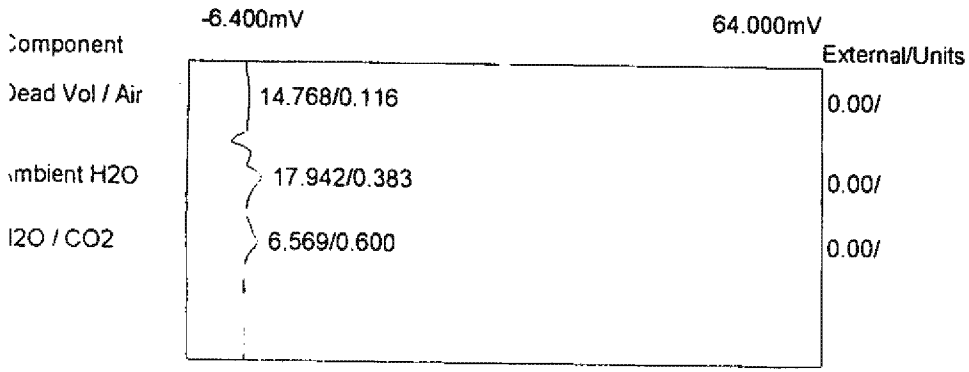
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:18:03
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW2-A02.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	61.896	0.00	
Ethylene Oxide	0.550	253.784	91.38	ppm
		315.680	91.38	

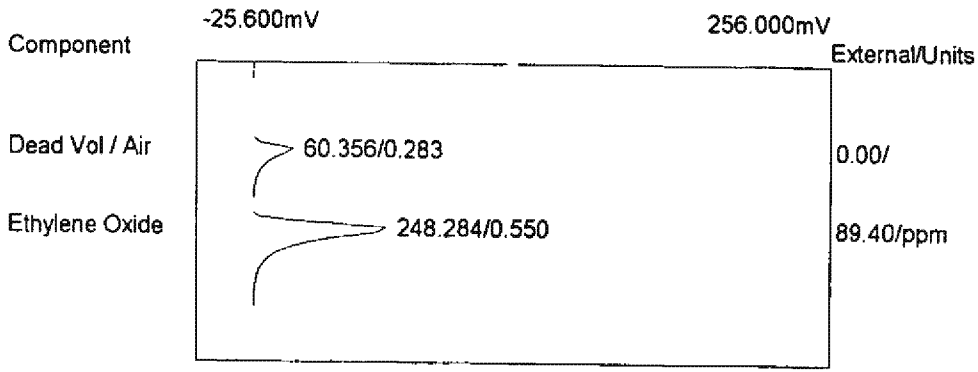
ED_002192_00004534-00069

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:23:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW2-A03.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.116	14.768	0.00	
Ambient H2O	0.383	17.942	0.00	
H2O / CO2	0.600	6.569	0.00	
		39.279	0.00	

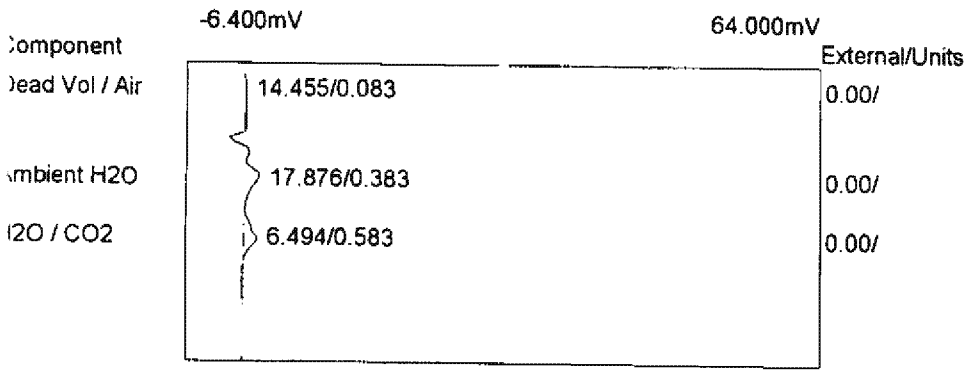
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:23:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW2-A03.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	60.356	0.00	
Ethylene Oxide	0.550	248.284	89.40	ppm
		308.640	89.40	

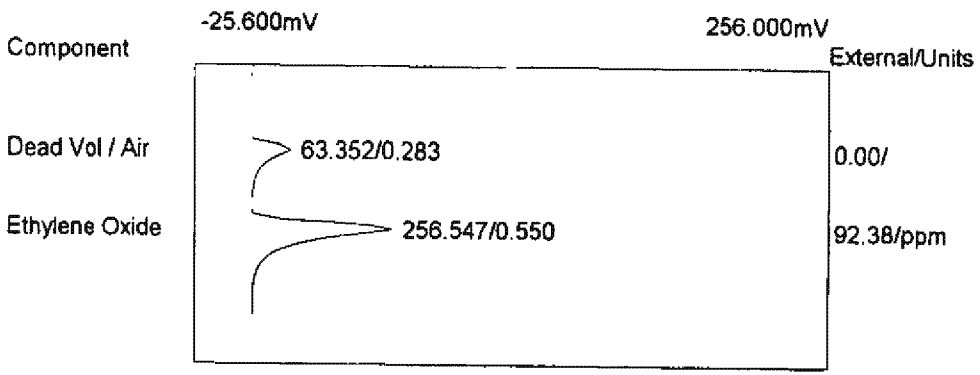
ED_002192_00004534-00070

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:28:16
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW2-A04.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	14.455	0.00	
Ambient H2O	0.383	17.876	0.00	
H2O / CO2	0.583	6.494	0.00	
		38.825	0.00	

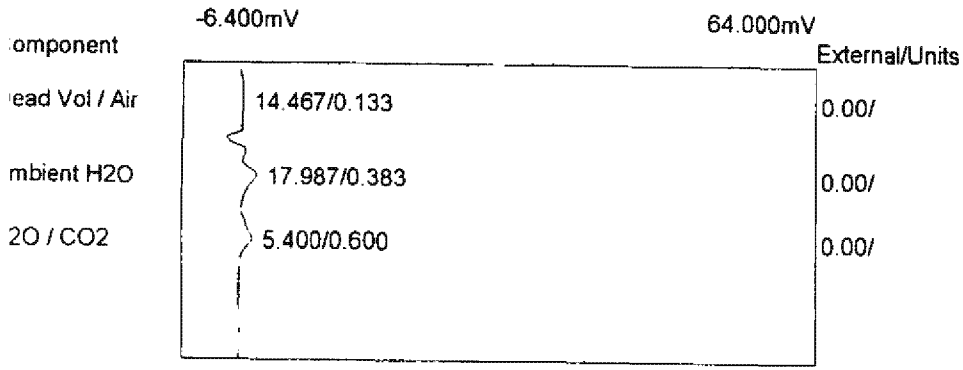
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:28:16
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW2-A04.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	63.352	0.00	
Ethylene Oxide	0.550	256.547	92.38	ppm
		319.899	92.38	

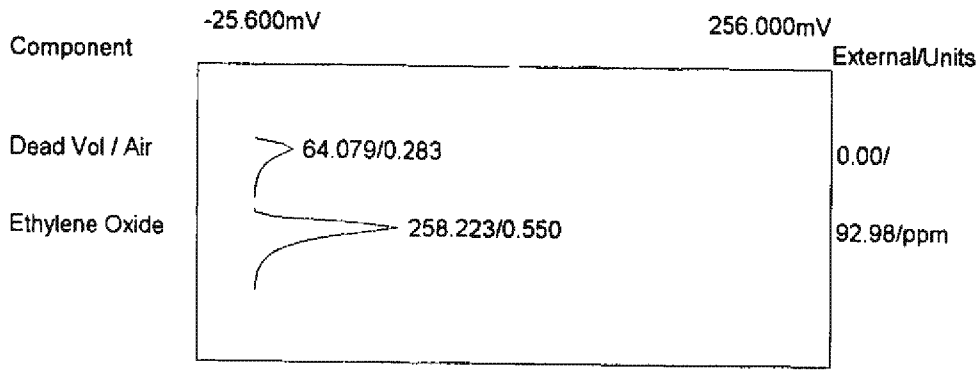
ED_002192_00004534-00071

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:33:02
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW2-A05.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ead Vol / Air	0.133	14.467	0.00	
mbient H2O	0.383	17.987	0.00	
2O / CO2	0.600	5.400	0.00	
		37.854	0.00	

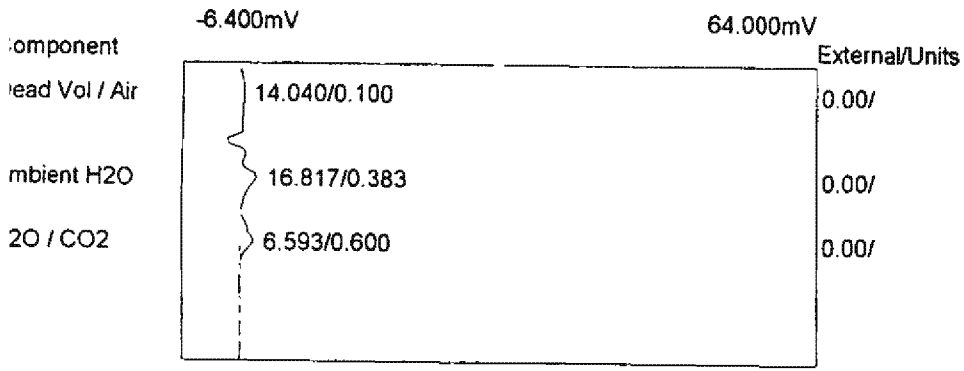
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:33:02
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW2-A05.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	64.079	0.00	
Ethylene Oxide	0.550	258.223	92.98	ppm
		322.302	92.98	

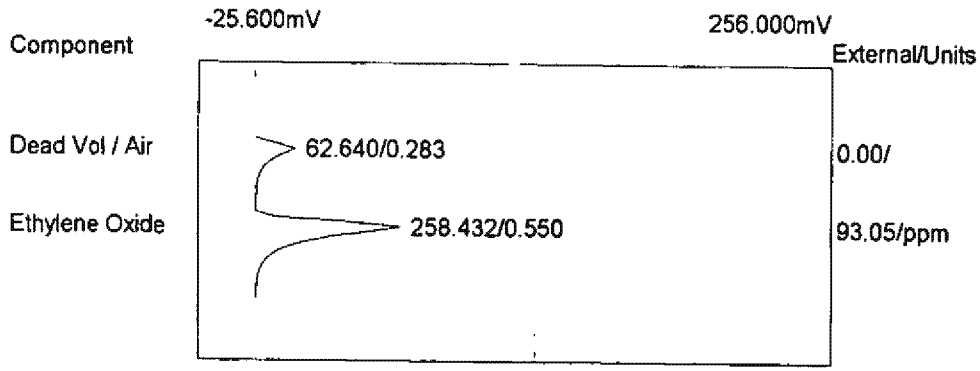
ED_002192_00004534-00072

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:38:02
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW2-A06.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ead Vol / Air	0.100	14.040	0.00	
mbient H2O	0.383	16.817	0.00	
2O / CO2	0.600	6.593	0.00	
		37.450	0.00	

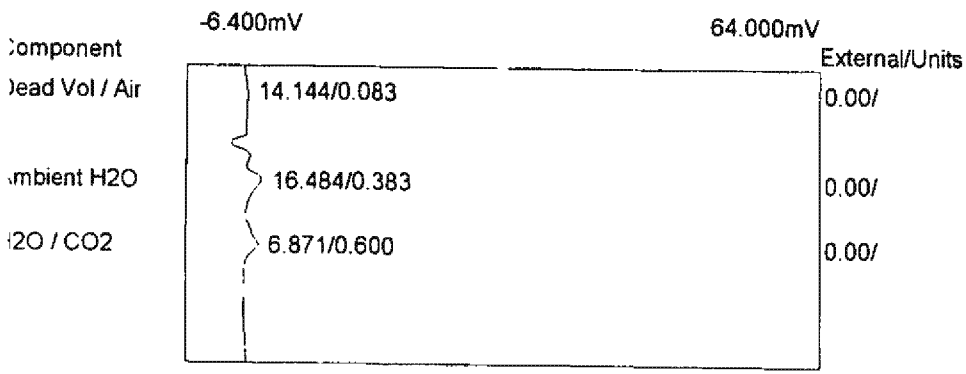
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:38:02
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW2-A06.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	62.640	0.00	
Ethylene Oxide	0.550	258.432	93.05	ppm
		321.072	93.05	

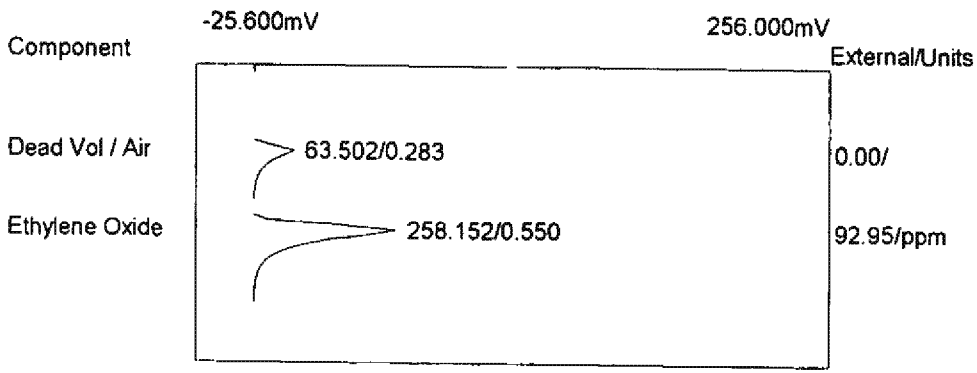
ED_002192_00004534-00073

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:43:45
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW2-A07.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	14.144	0.00	
Ambient H2O	0.383	16.484	0.00	
H2O / CO2	0.600	6.871	0.00	
		37.499	0.00	

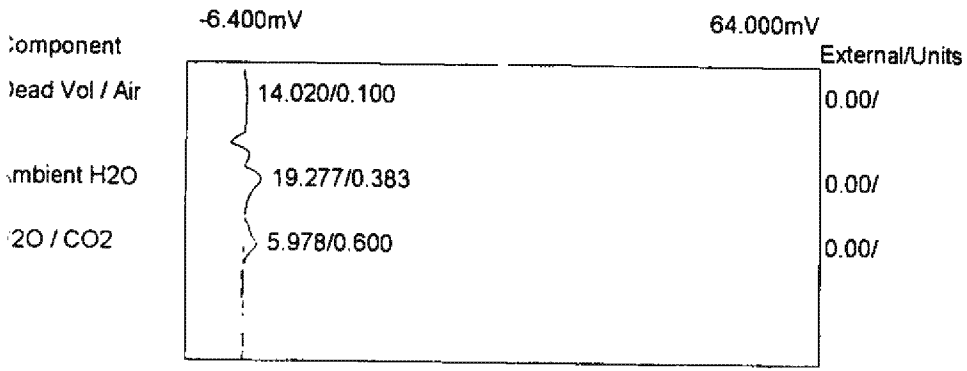
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:43:45
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW2-A07.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	63.502	0.00	
Ethylene Oxide	0.550	258.152	92.95	ppm
		321.654	92.95	

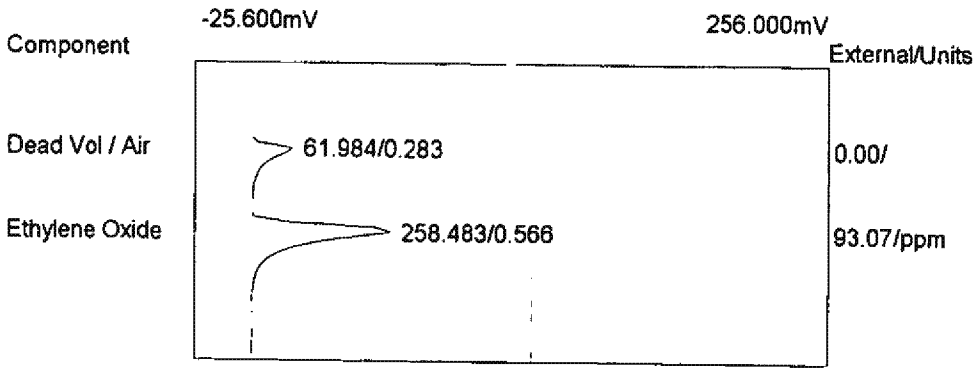
ED_002192_00004534-00074

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:48:04
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW2-A08.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	14.020	0.00	
Ambient H2O	0.383	19.277	0.00	
H2O / CO2	0.600	5.978	0.00	
		39.275	0.00	

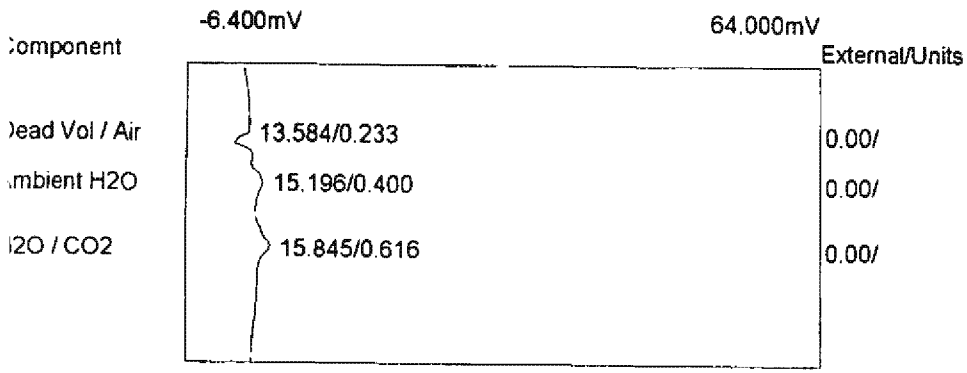
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:48:04
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW2-A08.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	61.984	0.00	
Ethylene Oxide	0.566	258.483	93.07	ppm
		320.467	93.07	

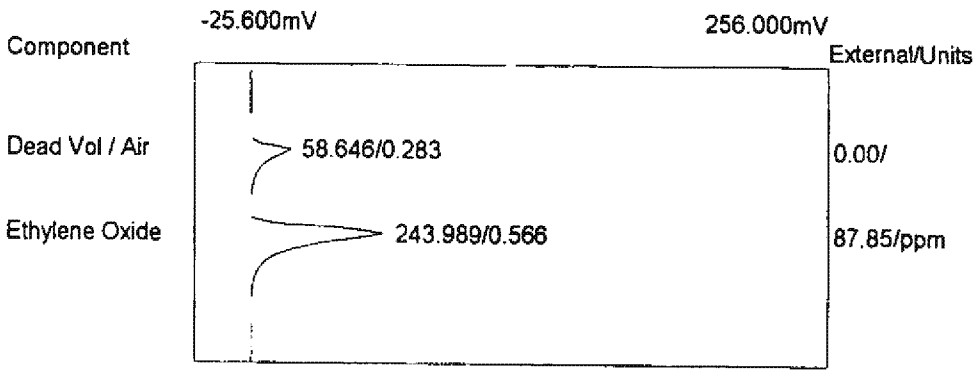
ED_002192_00004534-00075

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:54:43
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW2-A09.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	13.584	0.00	
Ambient H2O	0.400	15.196	0.00	
H2O / CO2	0.616	15.845	0.00	
		44.625	0.00	

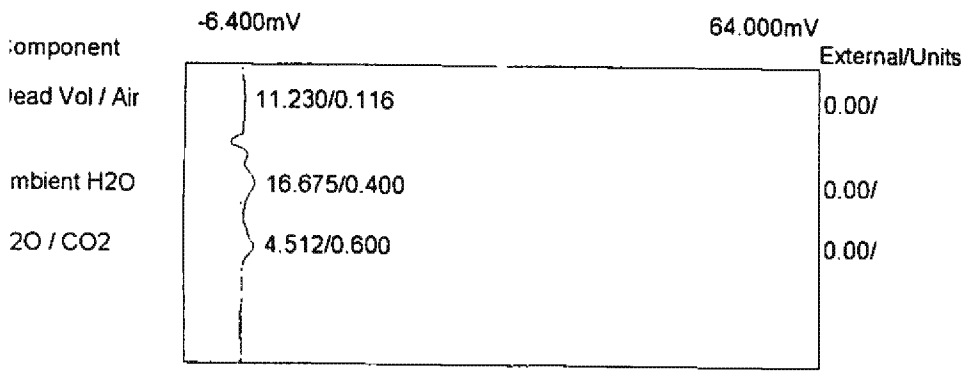
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:54:43
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW2-A09.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	58.646	0.00	
Ethylene Oxide	0.566	243.989	87.85	ppm
		302.635	87.85	

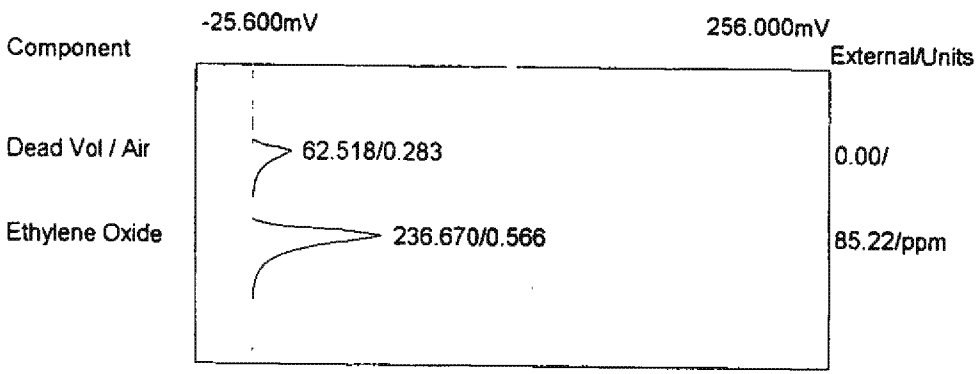
ED_002192_00004534-00076

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:58:03
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW2-A10.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
)ead Vol / Air	0.116	11.230	0.00	
\mbient H2O	0.400	16.675	0.00	
12O / CO2	0.600	4.512	0.00	
		32.417	0.00	

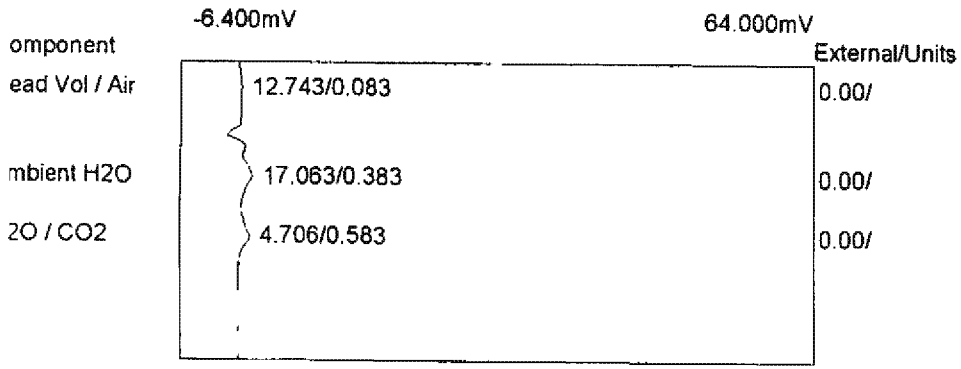
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 17:58:03
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW2-A10.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	62.518	0.00	
Ethylene Oxide	0.566	236.670	85.22	ppm
		299.188	85.22	

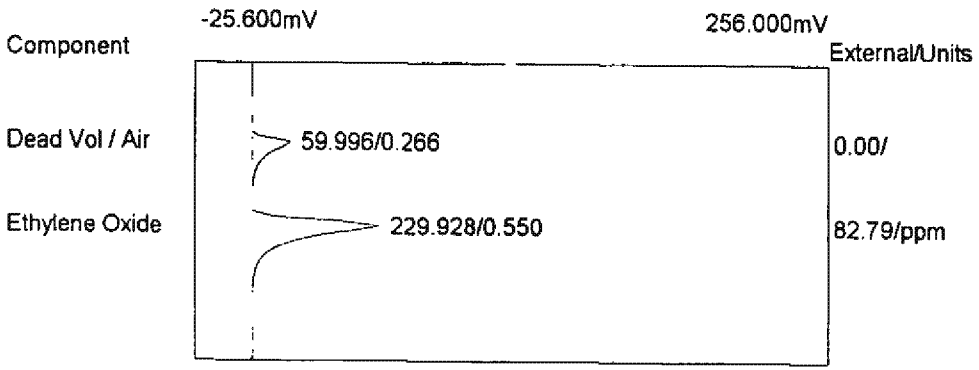
ED_002192_00004534-00077

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 18:03:36
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW2-A11.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ead Vol / Air	0.083	12.743	0.00	
mbient H2O	0.383	17.063	0.00	
2O / CO2	0.583	4.706	0.00	
		34.512	0.00	

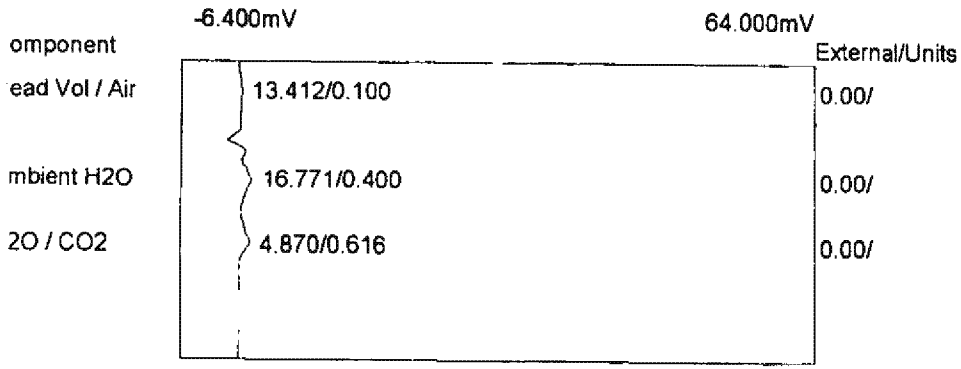
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 18:03:36
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW2-A11.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	59.996	0.00	
Ethylene Oxide	0.550	229.928	82.79	ppm
		289.924	82.79	

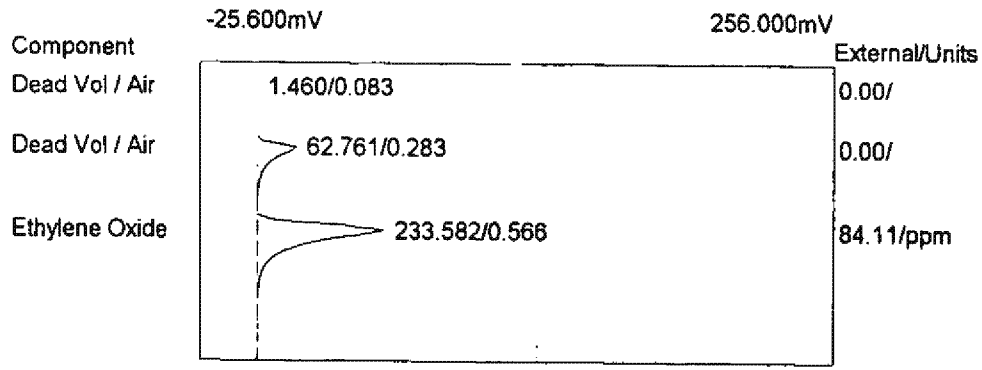
ED_002192_00004534-00078

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 18:08:22
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW2-A12.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ead Vol / Air	0.100	13.412	0.00	
mbient H2O	0.400	16.771	0.00	
2O / CO2	0.616	4.870	0.00	
		35.053	0.00	

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#2Aer
Analysis date: 01/23/2003 18:08:22
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW2-A12.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



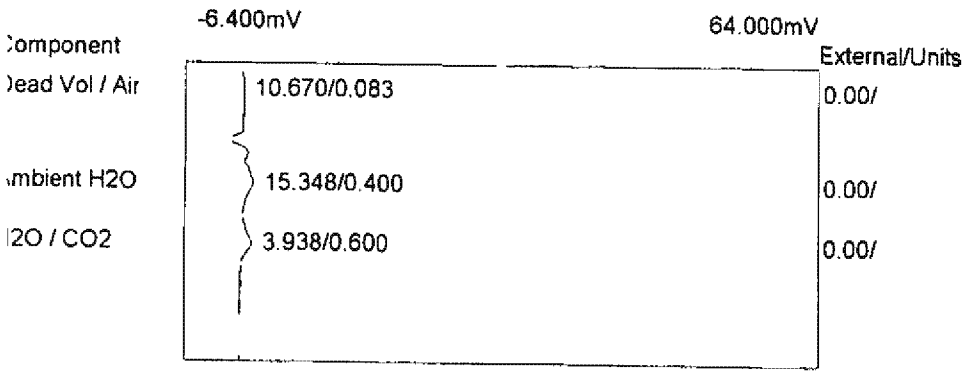
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	1.460	0.00	
Dead Vol / Air	0.283	62.761	0.00	
Ethylene Oxide	0.566	233.582	84.11	ppm
		297.803	84.11	

ED_002192_00004534-00079

APPENDIX D

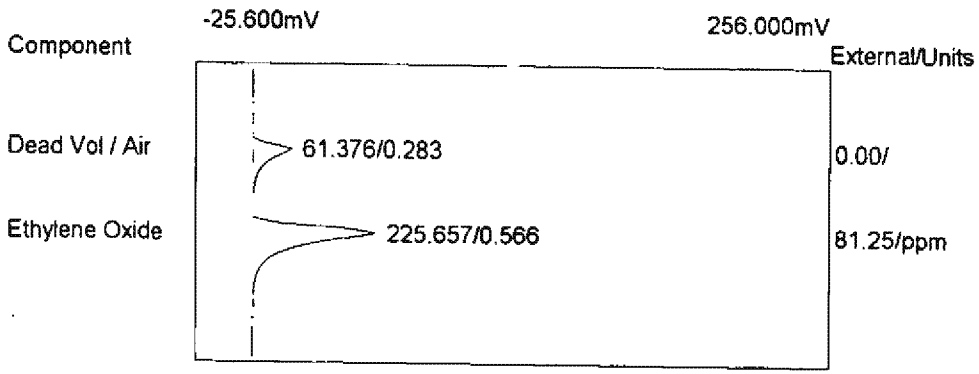
Plant 1 - Run #3 - Aeration Chromatograms - SC1 & SC2

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:13:20
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW3-A01.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	10.670	0.00	
Ambient H2O	0.400	15.348	0.00	
H2O / CO2	0.600	3.938	0.00	
		29.956	0.00	

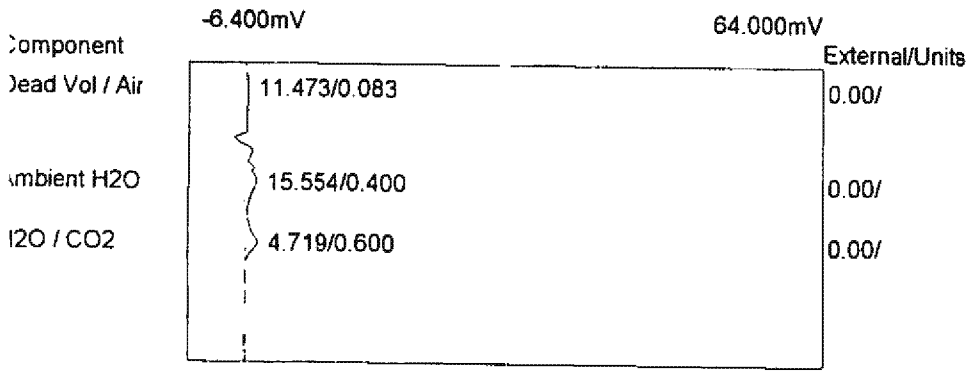
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:13:20
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW3-A01.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	61.376	0.00	
Ethylene Oxide	0.566	225.657	81.25	ppm
		287.033	81.25	

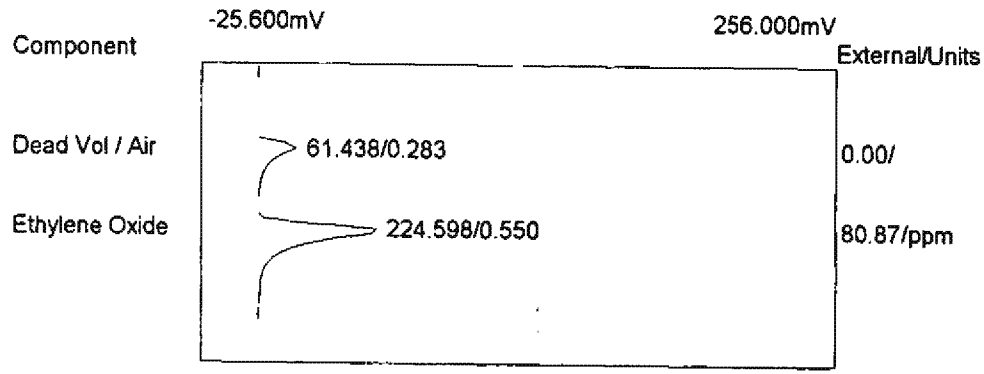
ED_002192_00004534-00081

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:18:12
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW3-A02.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	11.473	0.00	
Ambient H2O	0.400	15.554	0.00	
H2O / CO2	0.600	4.719	0.00	
		31.746	0.00	

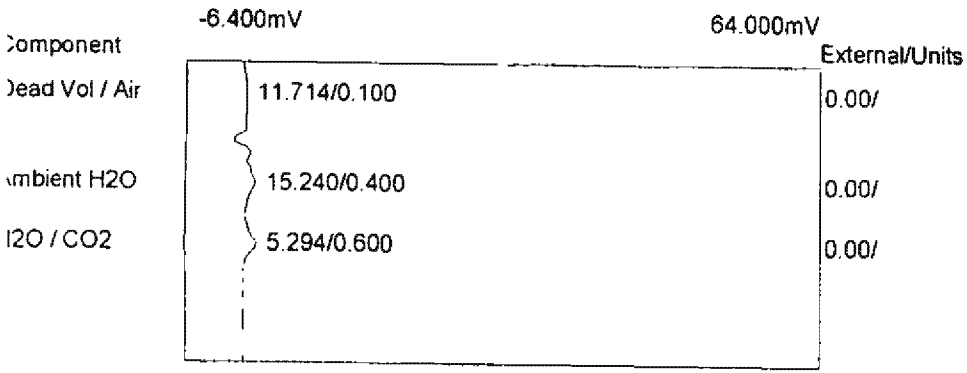
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:18:12
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW3-A02.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	61.438	0.00	
Ethylene Oxide	0.550	224.598	80.87	ppm
		286.036	80.87	

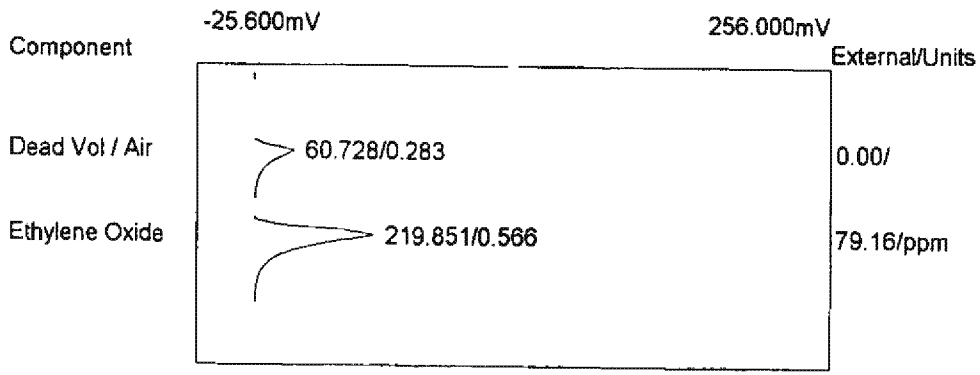
ED_002192_00004534-00082

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:23:09
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW3-A03.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	11.714	0.00	
Ambient H2O	0.400	15.240	0.00	
H2O / CO2	0.600	5.294	0.00	
		32.248	0.00	

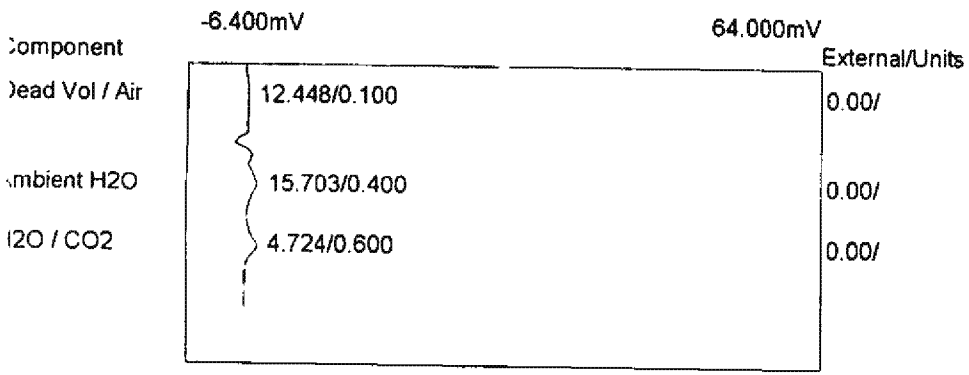
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:23:09
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW3-A03.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	60.728	0.00	
Ethylene Oxide	0.566	219.851	79.16	ppm
		280.579	79.16	

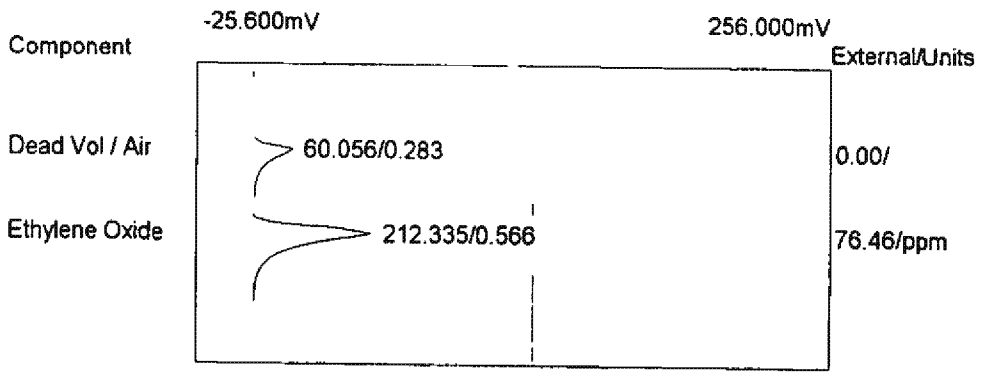
ED_002192_00004534-00083

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:28:10
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW3-A04.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	12.448	0.00	
Ambient H2O	0.400	15.703	0.00	
H2O / CO2	0.600	4.724	0.00	
		32.875	0.00	

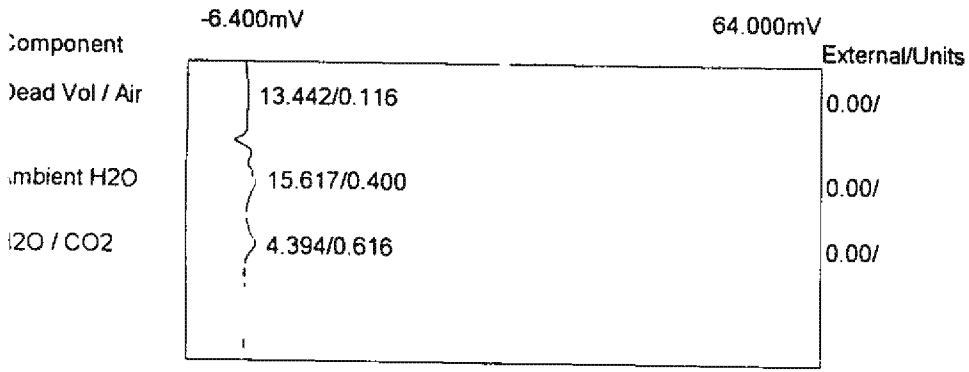
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:28:10
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW3-A04.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	60.056	0.00	
Ethylene Oxide	0.566	212.335	76.46	ppm
		272.391	76.46	

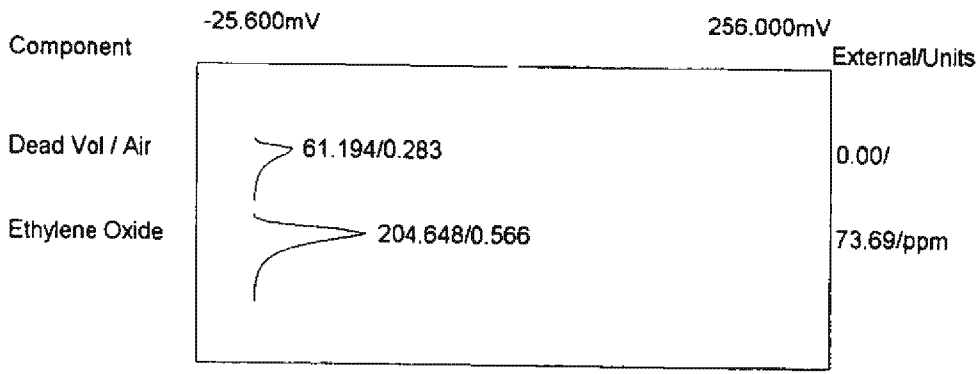
ED_002192_00004534-00084

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:33:10
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW3-A05.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.116	13.442	0.00	
Ambient H2O	0.400	15.617	0.00	
H2O / CO2	0.616	4.394	0.00	
		33.453	0.00	

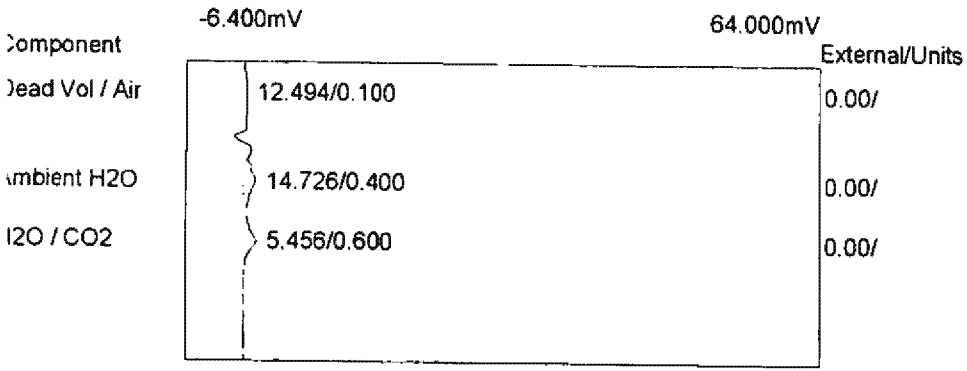
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:33:10
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW3-A05.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	61.194	0.00	
Ethylene Oxide	0.566	204.648	73.69	ppm
		265.842	73.69	

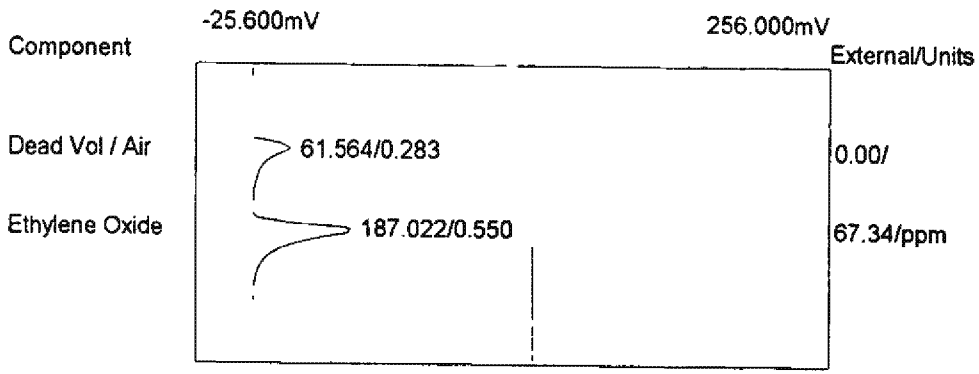
ED_002192_00004534-00085

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:38:13
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW3-A06.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	12.494	0.00	
Ambient H2O	0.400	14.726	0.00	
H2O / CO2	0.600	5.456	0.00	
		32.676	0.00	

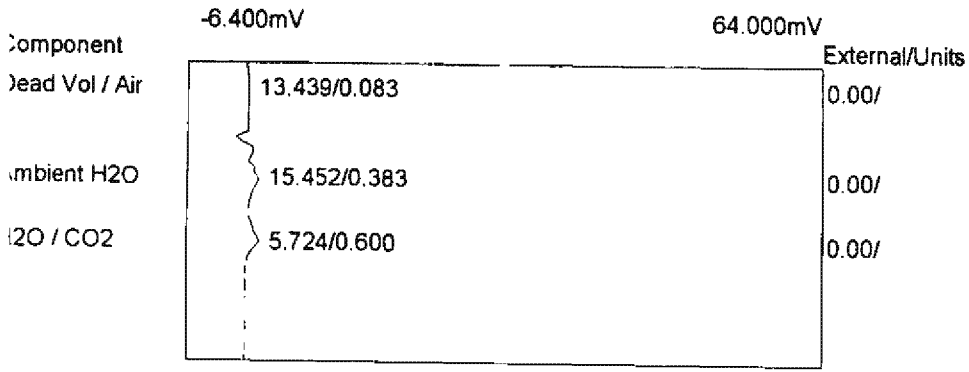
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:38:13
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW3-A06.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	61.564	0.00	
Ethylene Oxide	0.550	187.022	67.34	ppm
		248.586	67.34	

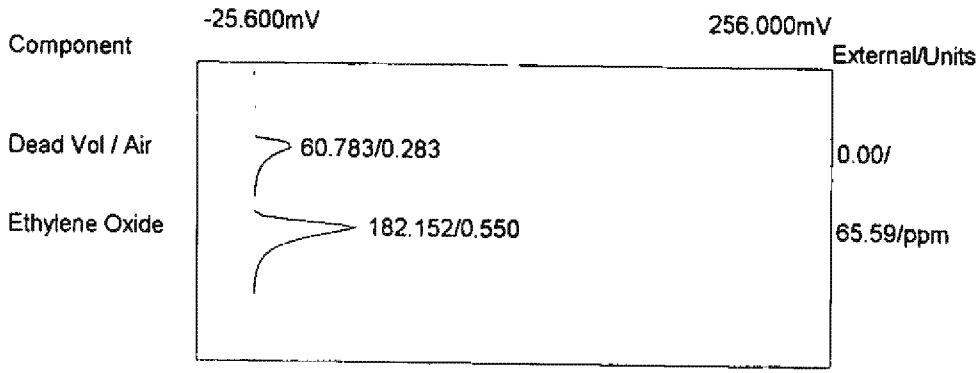
ED_002192_00004534-00086

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:43:12
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW3-A07.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	13.439	0.00	
Ambient H2O	0.383	15.452	0.00	
H2O / CO2	0.600	5.724	0.00	
		34.615	0.00	

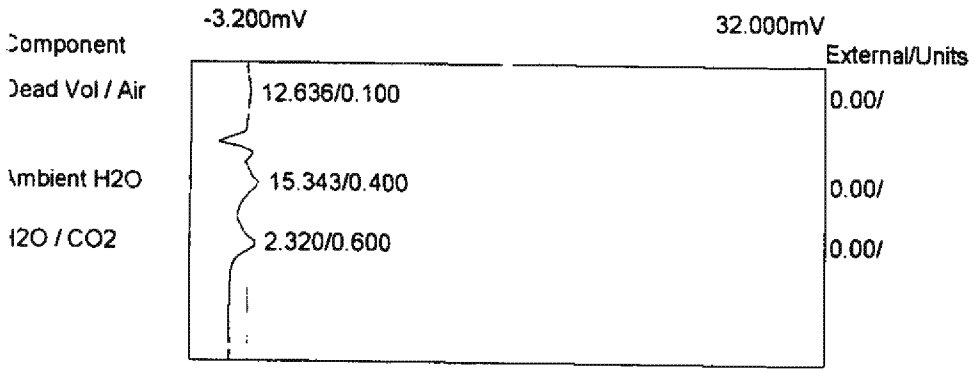
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:43:12
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW3-A07.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	60.783	0.00	
Ethylene Oxide	0.550	182.152	65.59	ppm
		242.935	65.59	

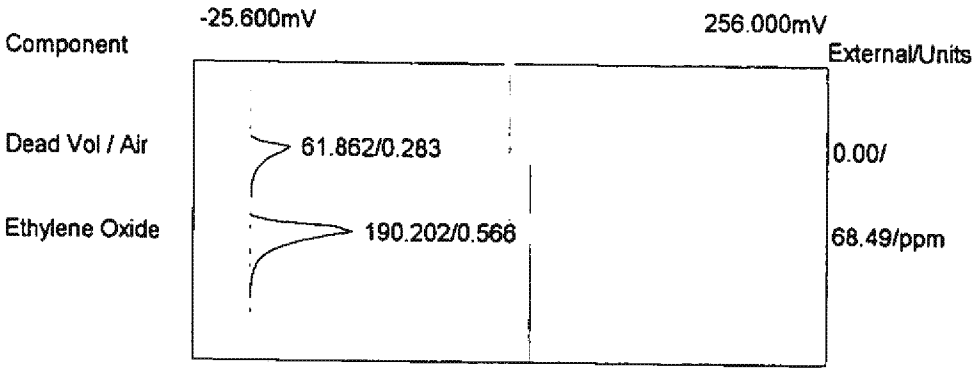
ED_002192_00004534-00087

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:48:07
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW3-A08.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	12.636	0.00	
Ambient H2O	0.400	15.343	0.00	
H2O / CO2	0.600	2.320	0.00	
		30.299	0.00	

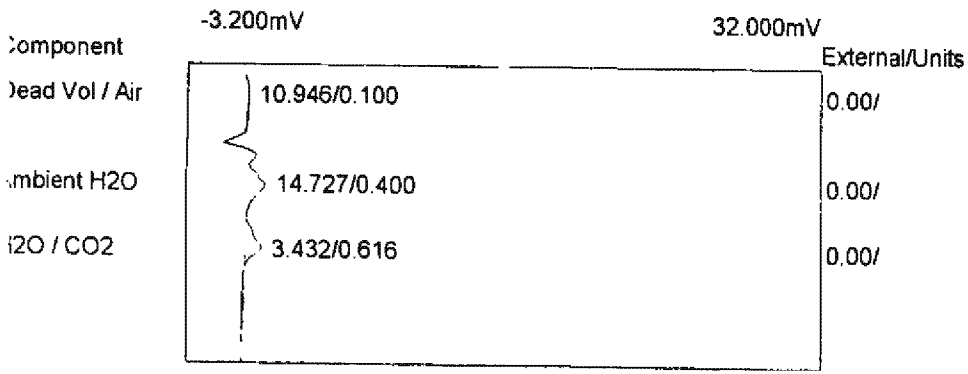
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:48:07
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW3-A08.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	61.862	0.00	
Ethylene Oxide	0.566	190.202	68.49	ppm
		252.064	68.49	

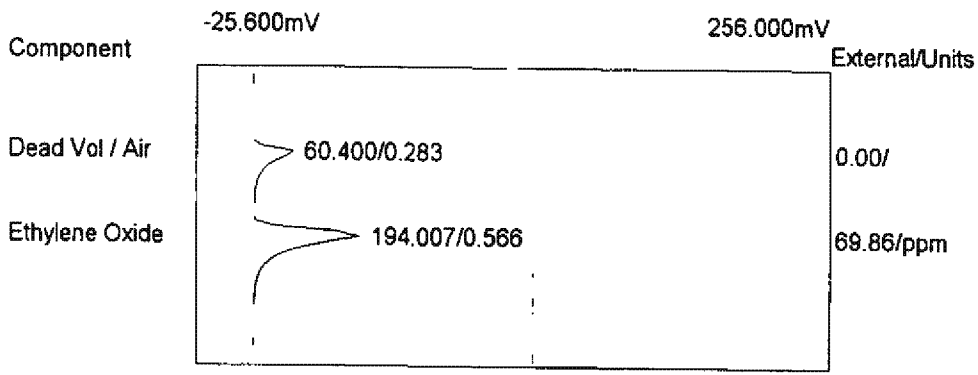
ED_002192_00004534-00088

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:53:21
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW3-A09.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	10.946	0.00	
Ambient H2O	0.400	14.727	0.00	
H2O / CO2	0.616	3.432	0.00	
		29.105	0.00	

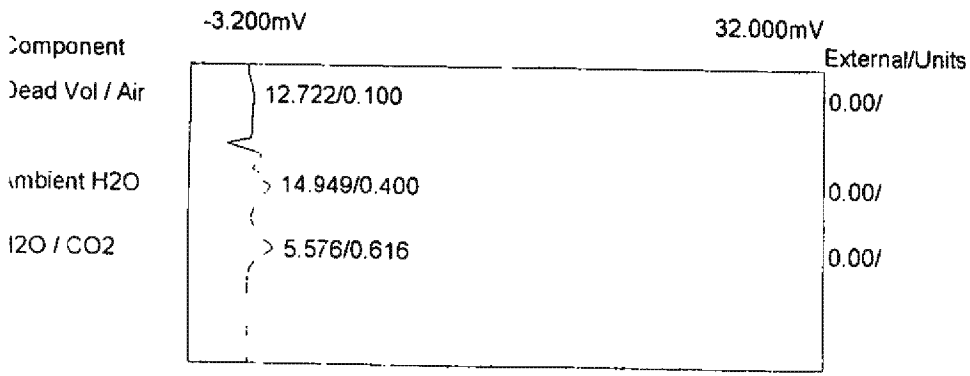
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:53:21
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW3-A09.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	60.400	0.00	
Ethylene Oxide	0.566	194.007	69.86	ppm
		254.407	69.86	

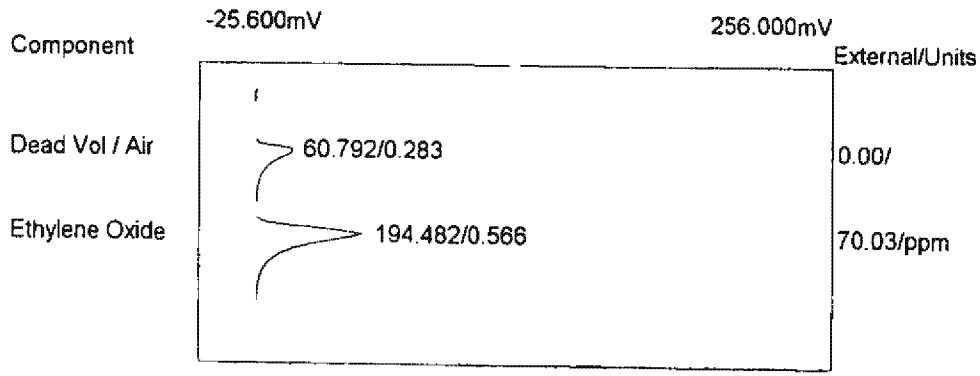
ED_002192_00004534-00089

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:58:27
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW3-A10.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	12.722	0.00	
Ambient H2O	0.400	14.949	0.00	
H2O / CO2	0.616	5.576	0.00	
		33.247	0.00	

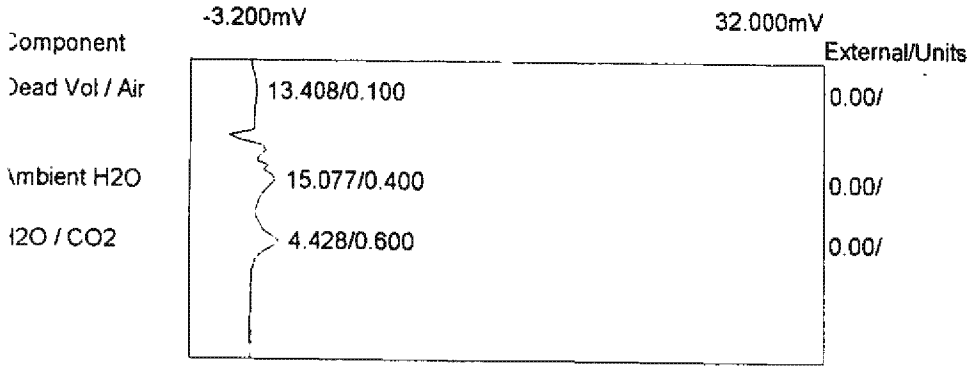
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 18:58:27
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW3-A10.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	60.792	0.00	
Ethylene Oxide	0.566	194.482	70.03	ppm
		255.274	70.03	

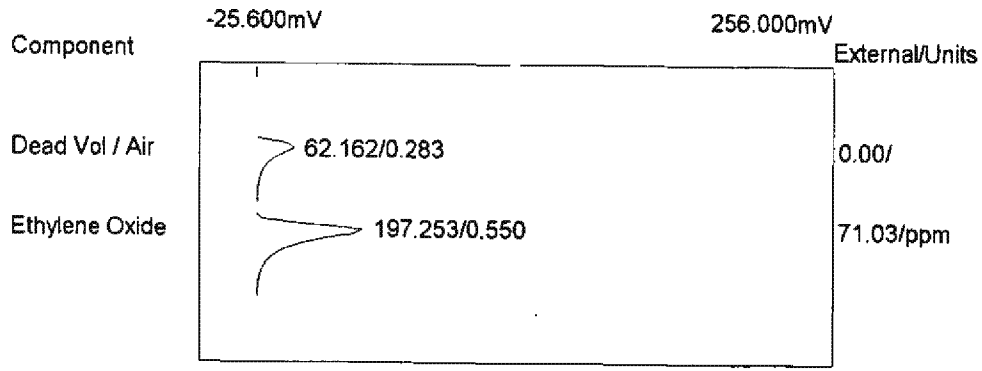
ED_002192_00004534-00090

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 19:03:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW3-A11.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	13.408	0.00	
Ambient H2O	0.400	15.077	0.00	
H2O / CO2	0.600	4.428	0.00	
		32.913	0.00	

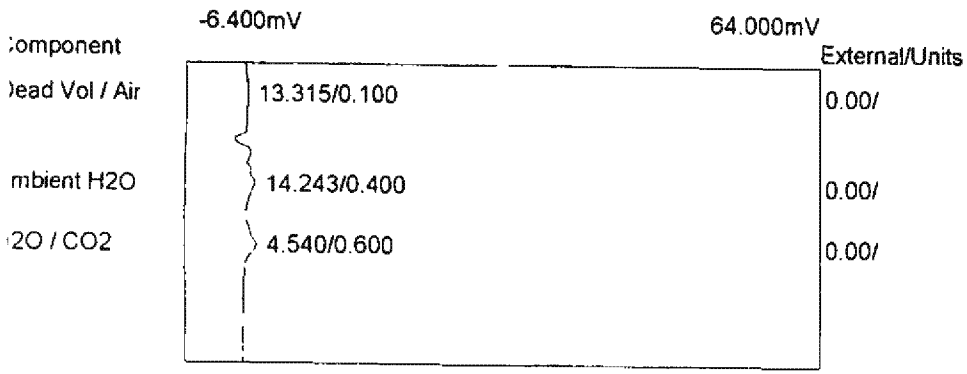
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 19:03:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW3-A11.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	62.162	0.00	
Ethylene Oxide	0.550	197.253	71.03	ppm
		259.415	71.03	

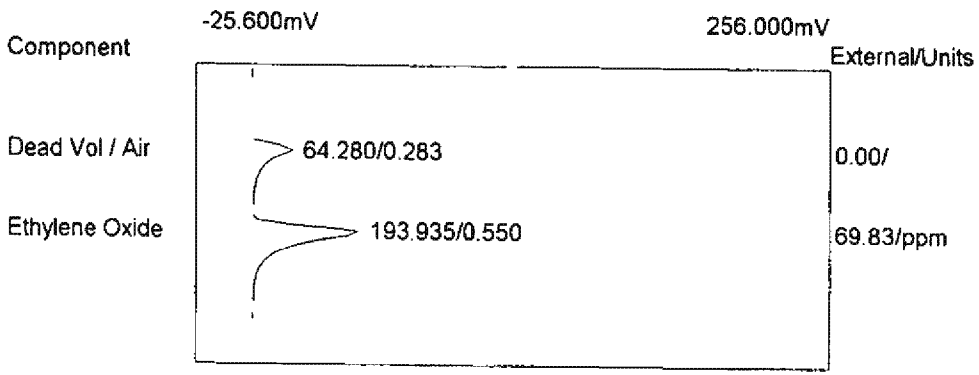
ED_002192_00004534-00091

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 19:08:17
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW3-A12.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	13.315	0.00	
Ambient H2O	0.400	14.243	0.00	
H2O / CO2	0.600	4.540	0.00	
		32.098	0.00	

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 19:08:17
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW3-A12.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



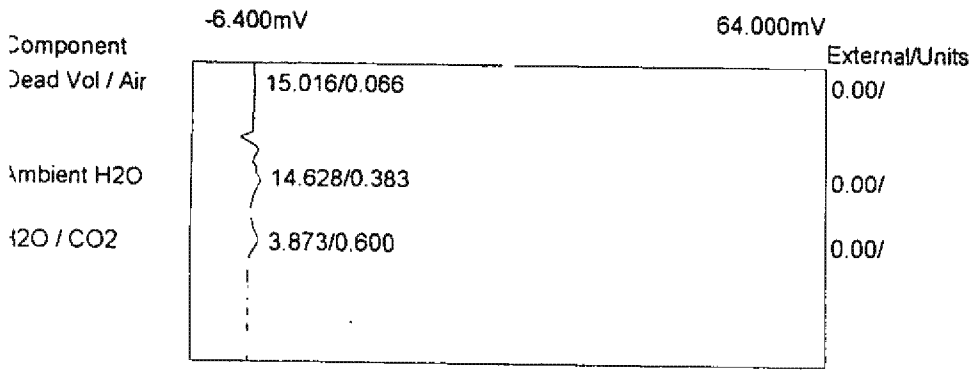
Component	Retention	Area	External	Units
Dead Vol / Air	0.283	64.280	0.00	
Ethylene Oxide	0.550	193.935	69.83	ppm
		258.215	69.83	

ED_002192_00004534-00092

APPENDIX E

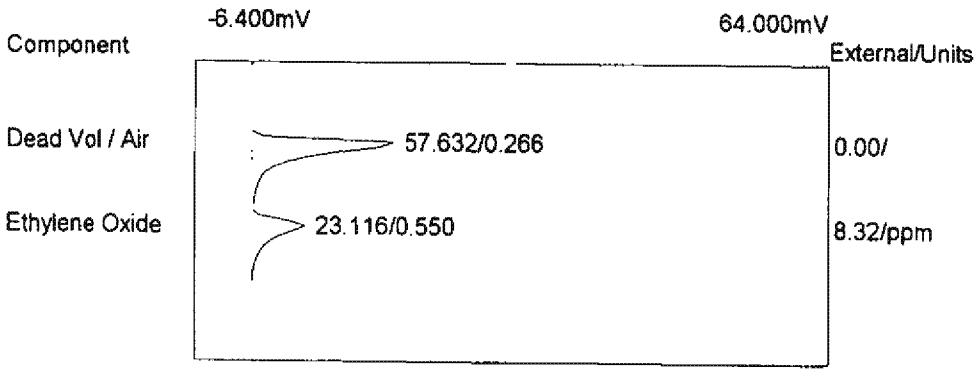
Plant 1 - Run #4 - Aeration Chromatograms - SC2 Only

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 19:54:50
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW4-A01.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.066	15.016	0.00	
Ambient H2O	0.383	14.628	0.00	
H2O / CO2	0.600	3.873	0.00	
		33.517	0.00	

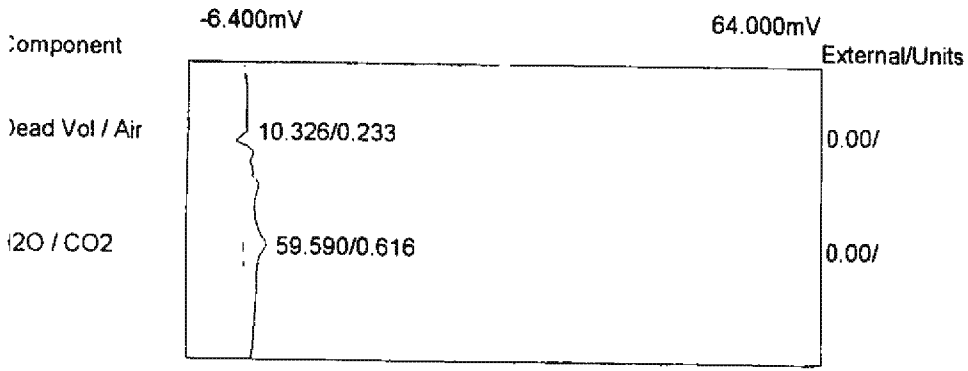
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 19:54:50
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW4-A01.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	57.632	0.00	
Ethylene Oxide	0.550	23.116	8.32	ppm
		80.748	8.32	

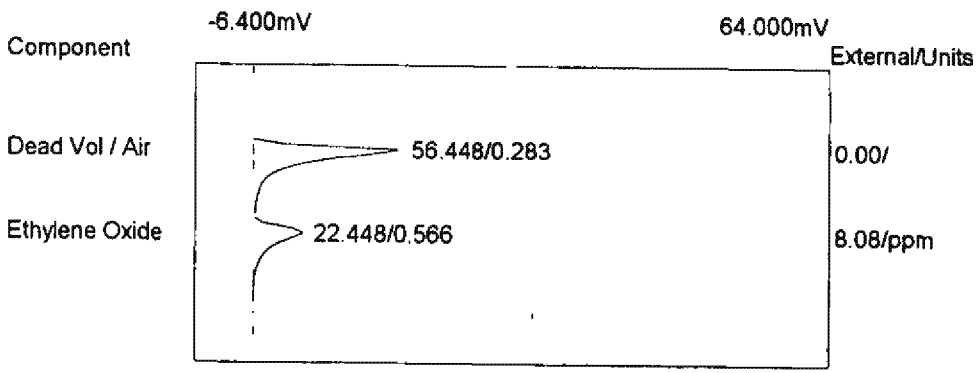
ED_002192_00004534-00094

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 19:59:12
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW4-A02.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	10.326	0.00	
H2O / CO2	0.616	59.590	0.00	
		69.916	0.00	

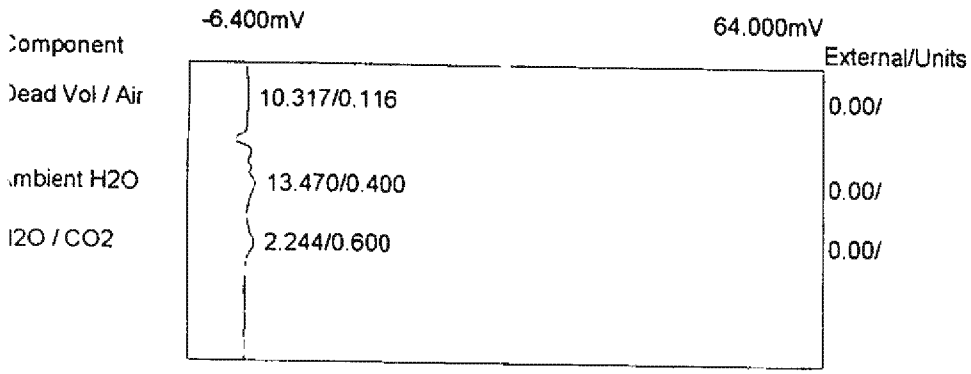
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 19:59:12
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW4-A02.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	56.448	0.00	
Ethylene Oxide	0.566	22.448	8.08	ppm
		78.896	8.08	

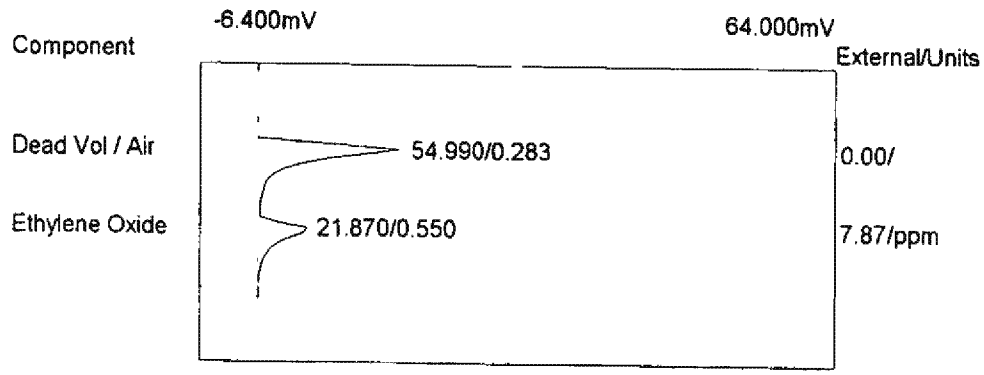
ED_002192_00004534-00095

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#~~3~~4Aer
Analysis date: 01/23/2003 20:04:33
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW4-A03.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.116	10.317	0.00	
Ambient H2O	0.400	13.470	0.00	
H2O / CO2	0.600	2.244	0.00	
		26.031	0.00	

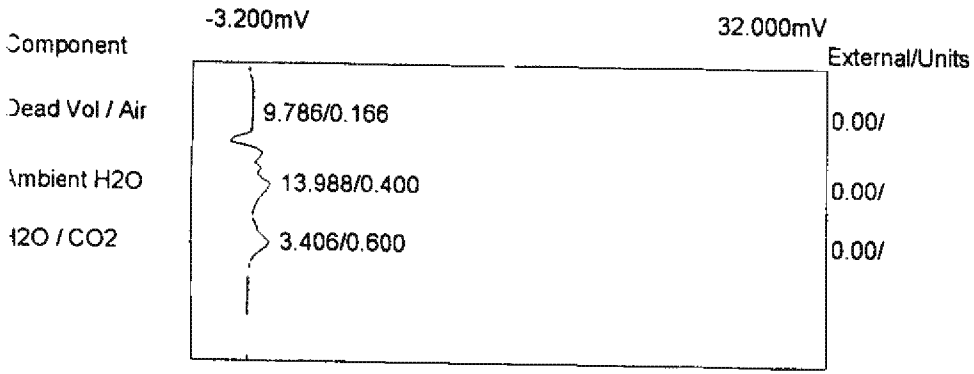
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#~~3~~4Aer
Analysis date: 01/23/2003 20:04:33
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW4-A03.CHR (c:\peakwin)
Sample: SC~~2~~1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	54.990	0.00	
Ethylene Oxide	0.550	21.870	7.87	ppm
		76.860	7.87	

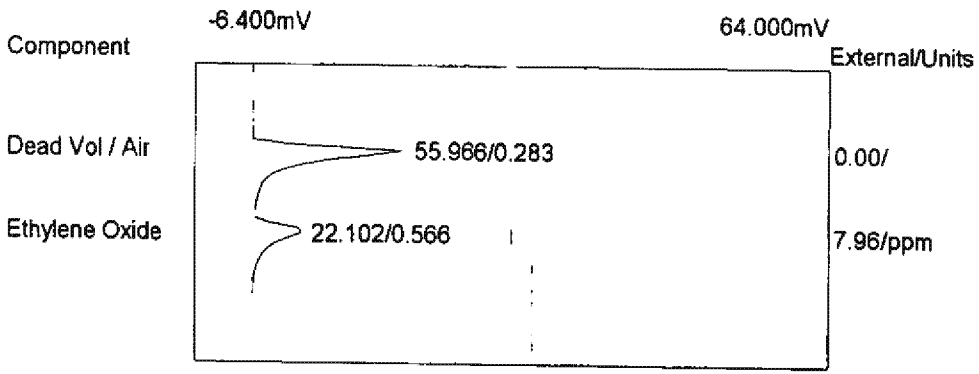
ED_002192_00004534-00096

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 20:09:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW4-A04.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.166	9.786	0.00	
Ambient H2O	0.400	13.988	0.00	
H2O / CO2	0.600	3.406	0.00	
		27.180	0.00	

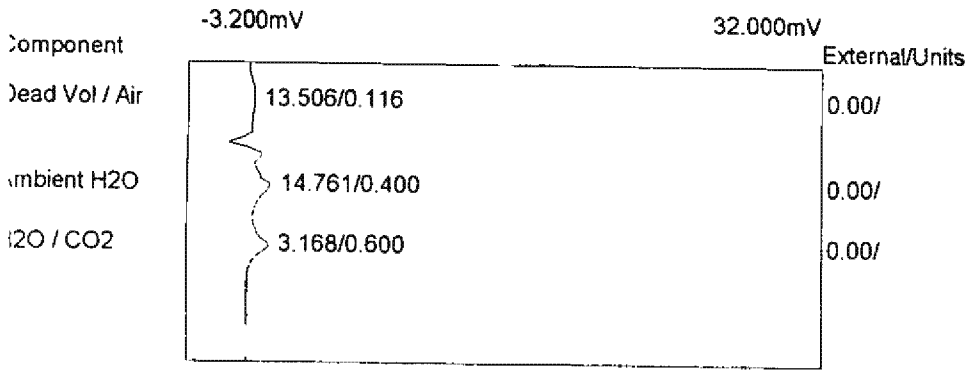
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#3Aer
Analysis date: 01/23/2003 20:09:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW4-A04.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	55.966	0.00	
Ethylene Oxide	0.566	22.102	7.96	ppm
		78.068	7.96	

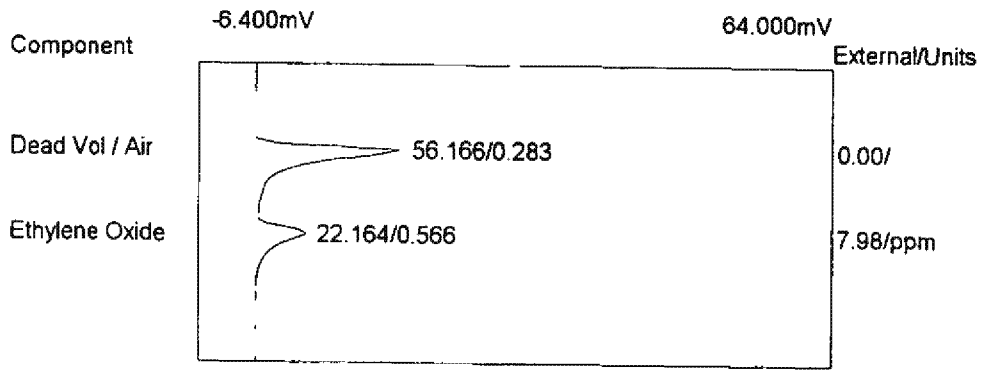
ED_002192_00004534-00097

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 20:14:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW4-A05.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.116	13.506	0.00	
Ambient H2O	0.400	14.761	0.00	
H2O / CO2	0.600	3.168	0.00	
		31.435	0.00	

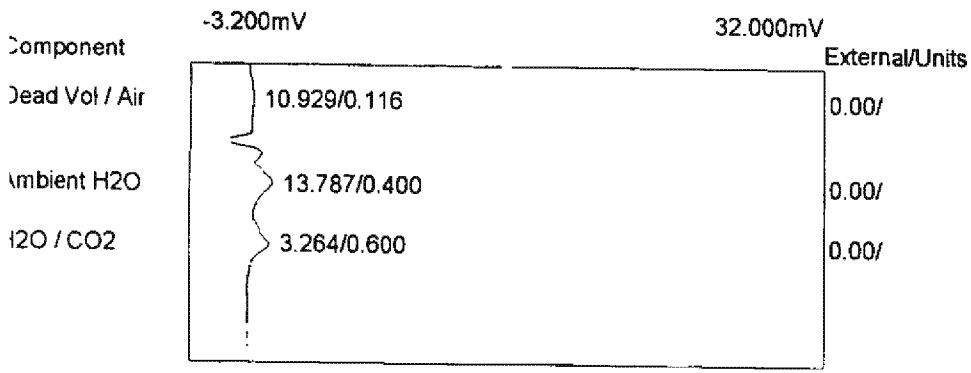
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 20:14:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW4-A05.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	56.166	0.00	
Ethylene Oxide	0.566	22.164	7.98	ppm
		78.330	7.98	

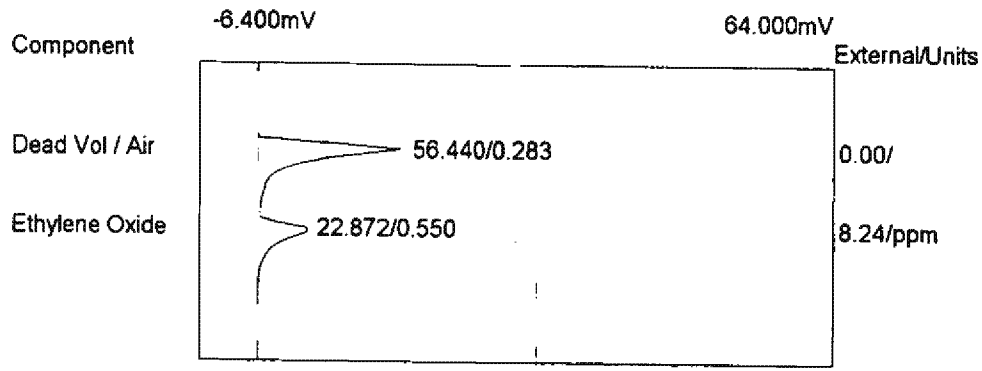
ED_002192_00004534-00098

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#4Aer
Analysis date: 01/23/2003 20:19:25
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW4-A06.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.116	10.929	0.00	
Ambient H2O	0.400	13.787	0.00	
H2O / CO2	0.600	3.264	0.00	
		27.980	0.00	

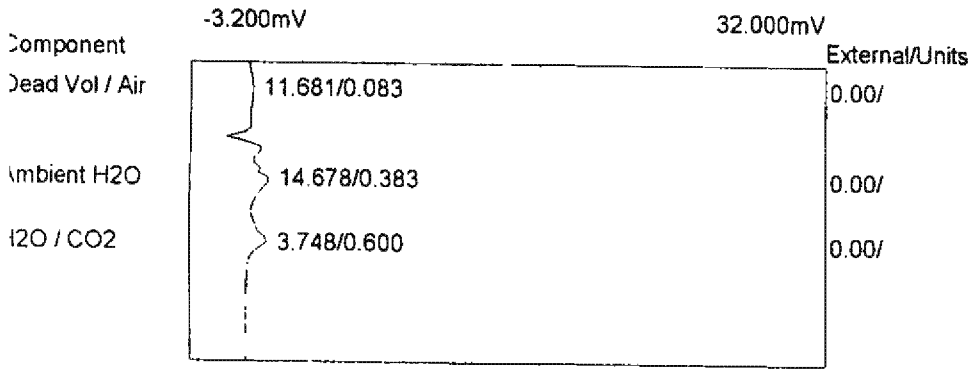
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#4Aer
Analysis date: 01/23/2003 20:19:25
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW4-A06.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	56.440	0.00	
Ethylene Oxide	0.550	22.872	8.24	ppm
		79.312	8.24	

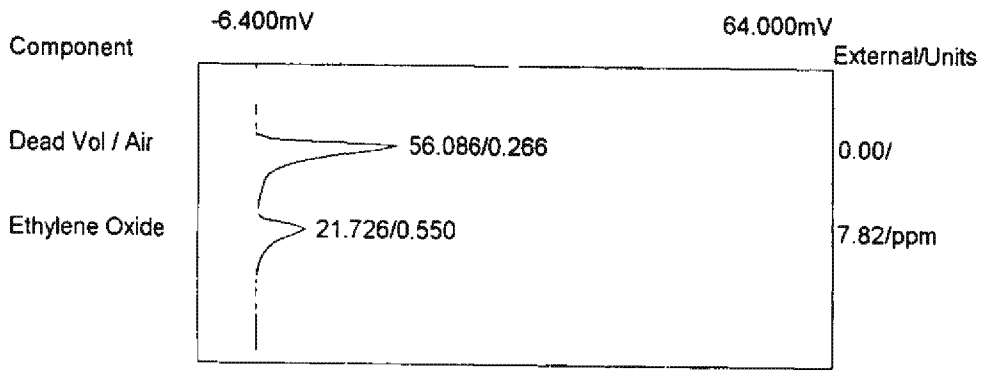
ED_002192_00004534-00099

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#4Aer
Analysis date: 01/23/2003 20:24:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW4-A07.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	11.681	0.00	
Ambient H2O	0.383	14.678	0.00	
H2O / CO2	0.600	3.748	0.00	
		30.107	0.00	

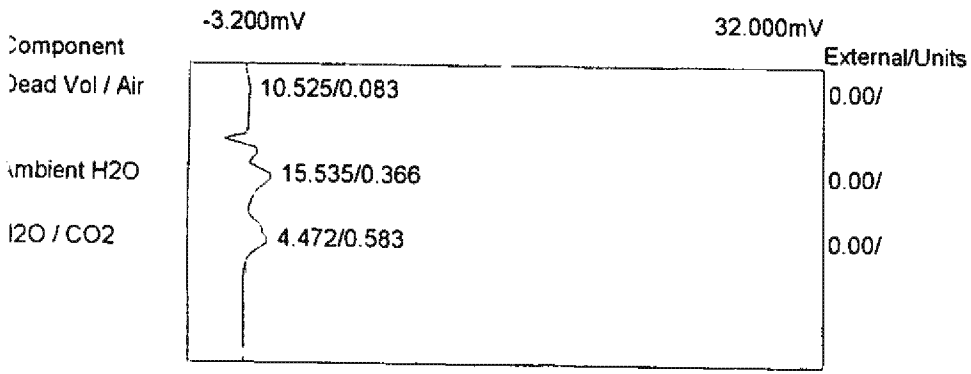
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#4Aer
Analysis date: 01/23/2003 20:24:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW4-A07.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	56.086	0.00	
Ethylene Oxide	0.550	21.726	7.82	ppm
		77.812	7.82	

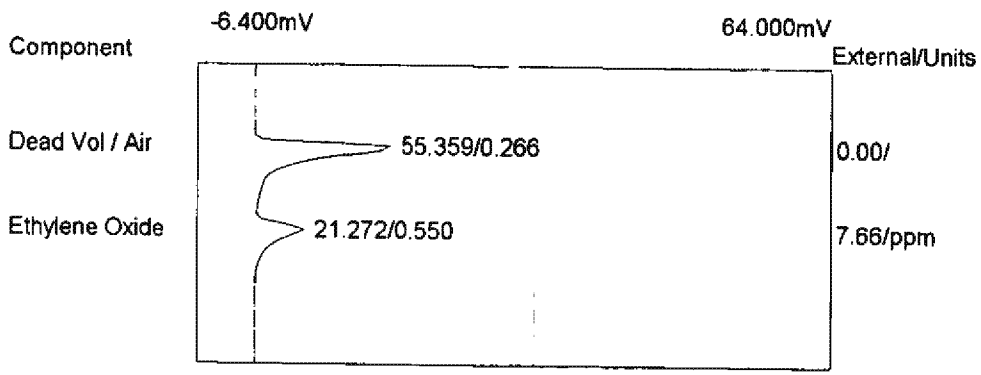
ED_002192_00004534-00100

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#4Aer
Analysis date: 01/23/2003 20:29:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW4-A08.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	10.525	0.00	
Ambient H2O	0.366	15.535	0.00	
H2O / CO2	0.583	4.472	0.00	
		30.532	0.00	

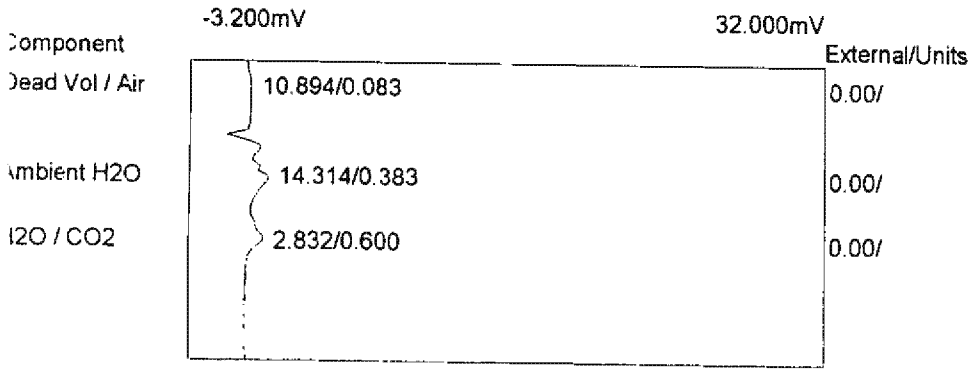
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#4Aer
Analysis date: 01/23/2003 20:29:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW4-A08.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	55.359	0.00	
Ethylene Oxide	0.550	21.272	7.66	ppm
		76.631	7.66	

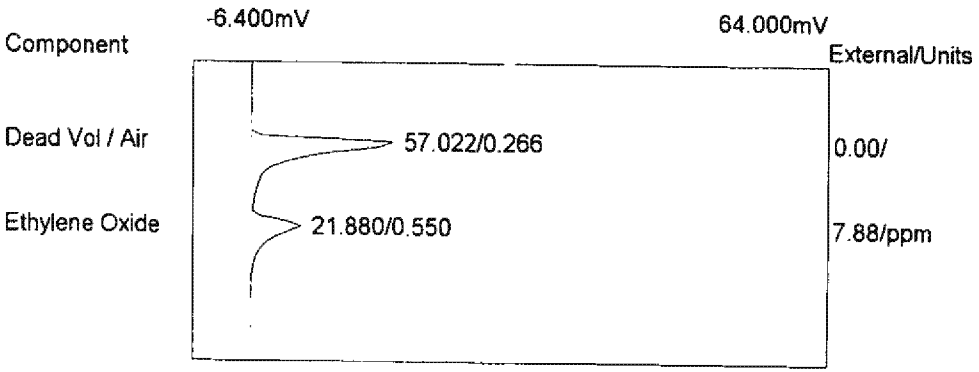
ED_002192_00004534-00101

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#4Aer
Analysis date: 01/23/2003 20:34:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW4-A09.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	10.894	0.00	
Ambient H2O	0.383	14.314	0.00	
H2O / CO2	0.600	2.832	0.00	
		28.040	0.00	

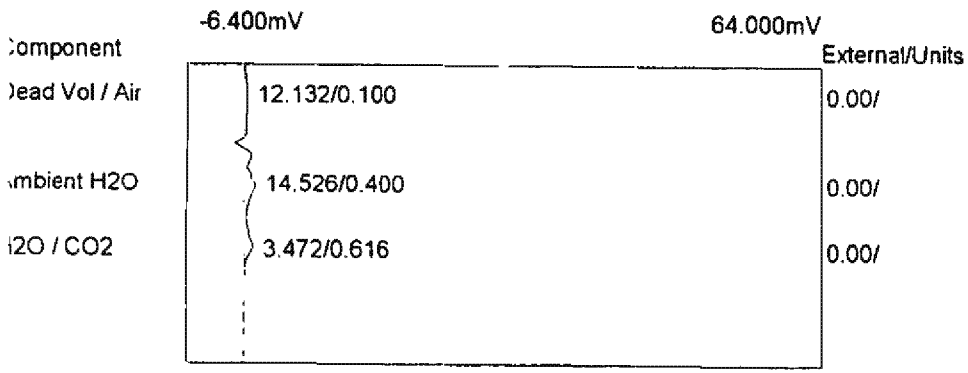
Lab name: Kremer Environmental Svcs
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#4Aer
Analysis date: 01/23/2003 20:34:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW4-A09.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	57.022	0.00	
Ethylene Oxide	0.550	21.880	7.88	ppm
		78.902	7.88	

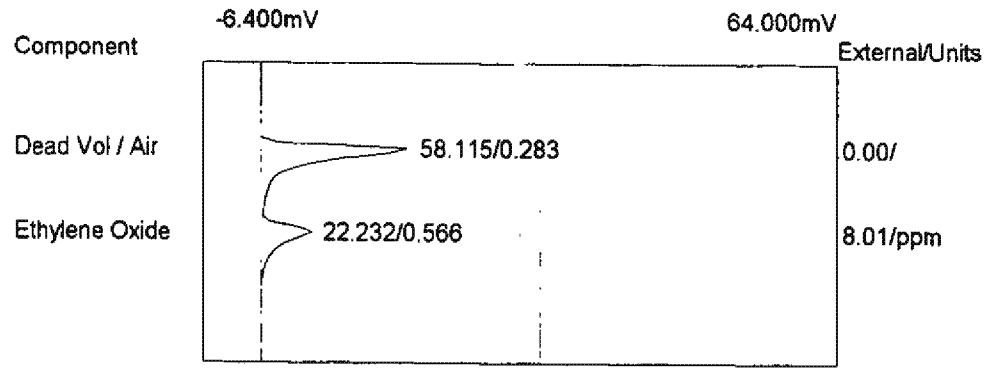
ED_002192_00004534-00102

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#4Aer
Analysis date: 01/23/2003 20:39:10
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW4-A10.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	12.132	0.00	
Ambient H2O	0.400	14.526	0.00	
H2O / CO2	0.616	3.472	0.00	
		30.130	0.00	

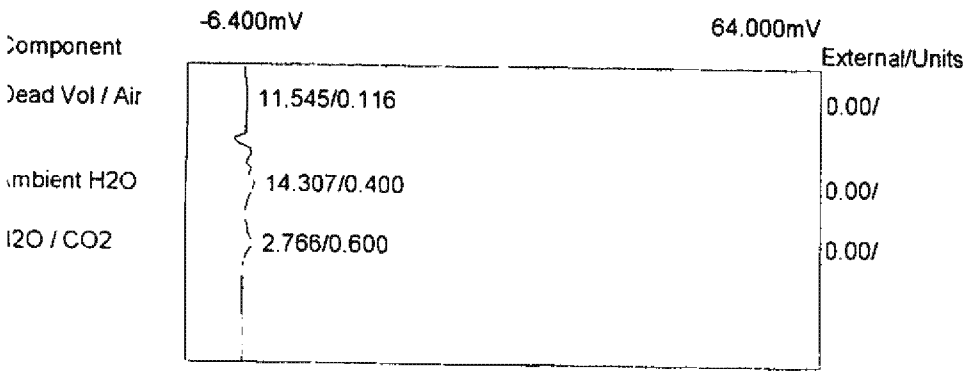
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#4Aer
Analysis date: 01/23/2003 20:39:10
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW4-A10.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	58.115	0.00	
Ethylene Oxide	0.566	22.232	8.01	ppm
		80.347	8.01	

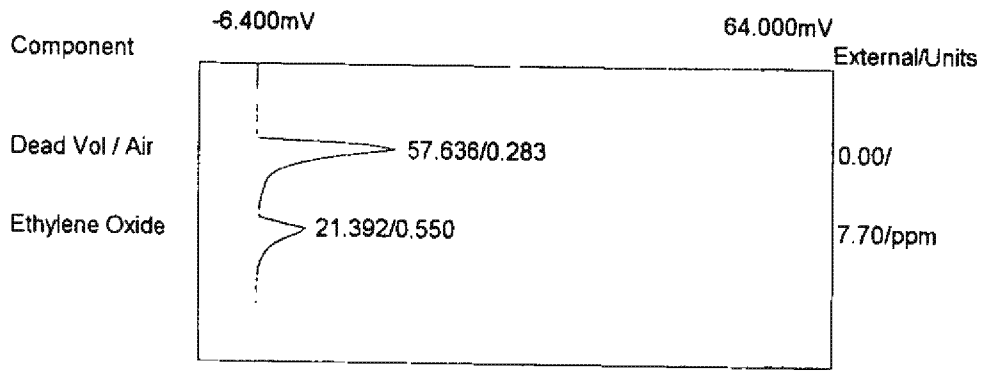
ED_002192_00004534-00103

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#4Aer
Analysis date: 01/23/2003 20:44:02
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW4-A11.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.116	11.545	0.00	
Ambient H2O	0.400	14.307	0.00	
H2O / CO2	0.600	2.766	0.00	
		28.618	0.00	

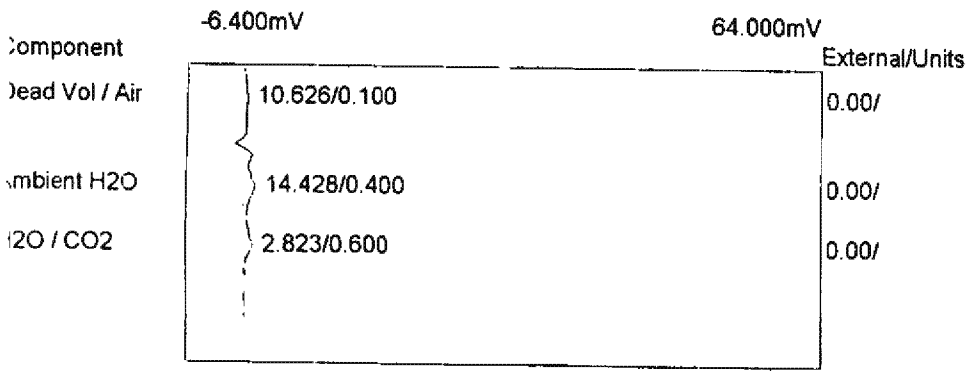
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#4Aer
Analysis date: 01/23/2003 20:44:02
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW4-A11.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	57.636	0.00	
Ethylene Oxide	0.550	21.392	7.70	ppm
		79.028	7.70	

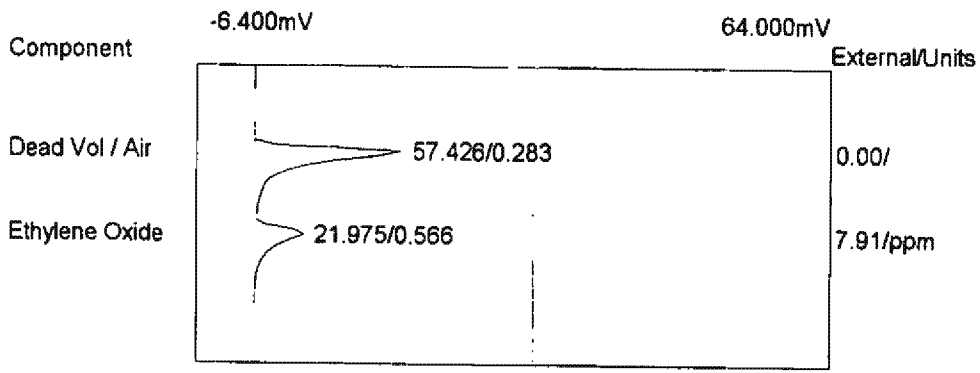
ED_002192_00004534-00104

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#4Aer
Analysis date: 01/23/2003 20:49:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW4-A12.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	10.626	0.00	
Ambient H2O	0.400	14.428	0.00	
H2O / CO2	0.600	2.823	0.00	
		27.877	0.00	

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#4Aer
Analysis date: 01/23/2003 20:49:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW4-A12.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



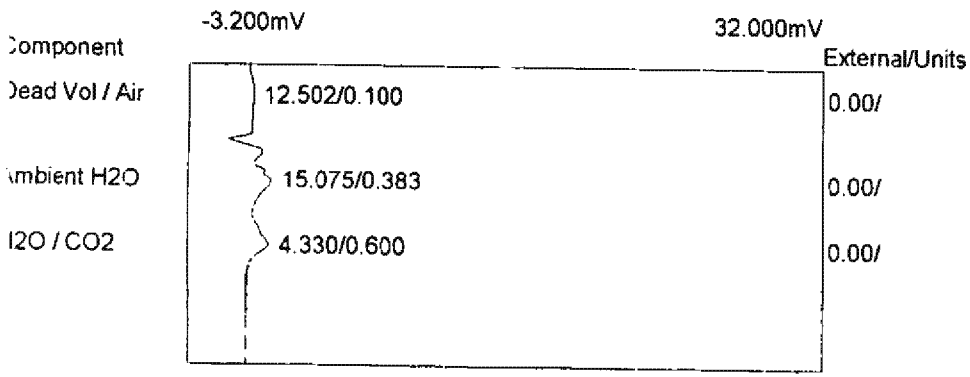
Component	Retention	Area	External	Units
Dead Vol / Air	0.283	57.426	0.00	
Ethylene Oxide	0.566	21.975	7.91	ppm
		79.401	7.91	

ED_002192_00004534-00105

APPENDIX F

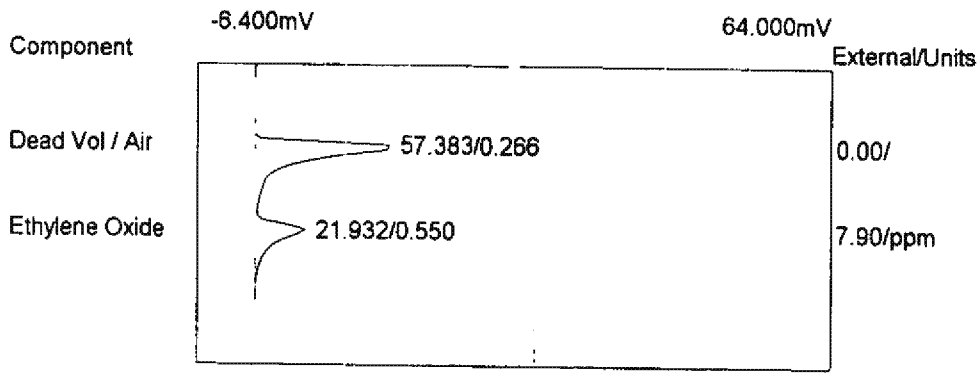
Plant 1 - Run #5 - Aeration Chromatograms - SC2 Only

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 20:54:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW5-A01.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	12.502	0.00	
Ambient H2O	0.383	15.075	0.00	
H2O / CO2	0.600	4.330	0.00	
		31.907	0.00	

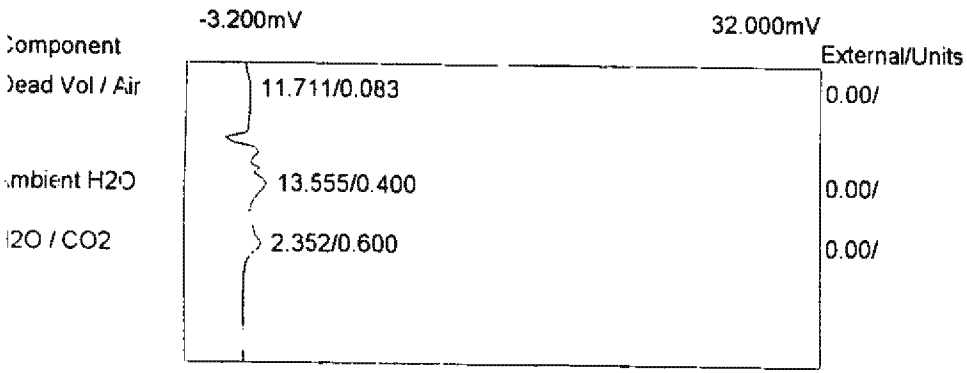
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 20:54:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW5-A01.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	57.383	0.00	
Ethylene Oxide	0.550	21.932	7.90	ppm
		79.315	7.90	

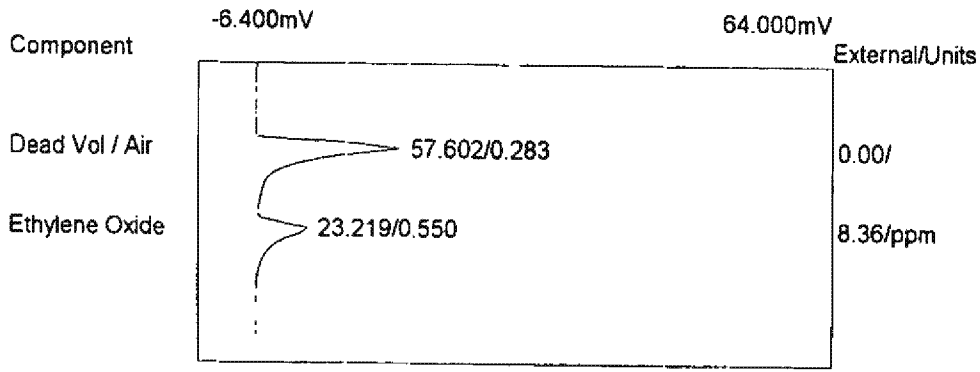
ED_002192_00004534-00107

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 20:59:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW5-A02.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	11.711	0.00	
Ambient H2O	0.400	13.555	0.00	
H2O / CO2	0.600	2.352	0.00	
		27.618	0.00	

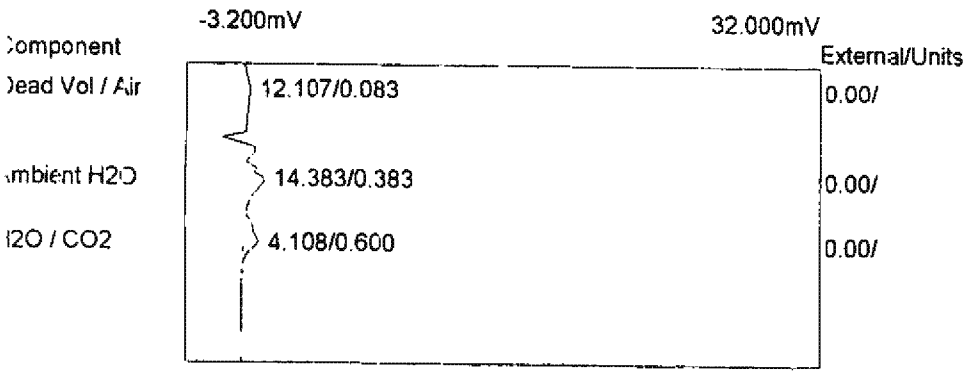
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 20:59:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW5-A02.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	57.602	0.00	
Ethylene Oxide	0.550	23.219	8.36	ppm
		80.821	8.36	

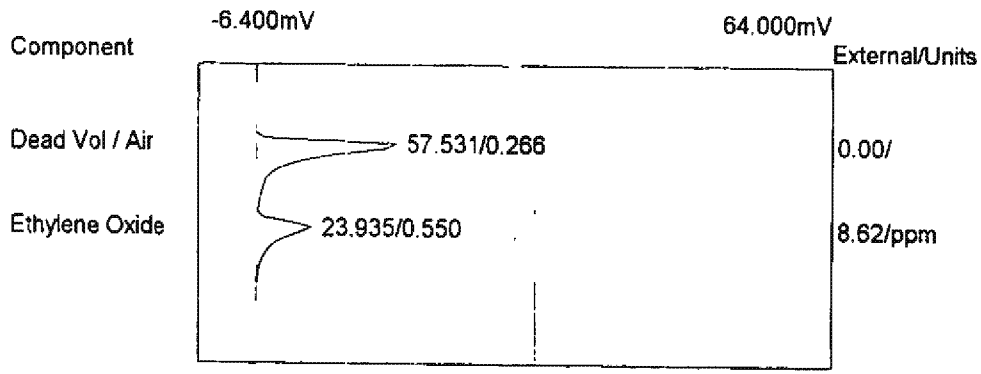
ED_002192_00004534-00108

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:04:04
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW5-A03.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	12.107	0.00	
Ambient H2O	0.383	14.383	0.00	
H2O / CO2	0.600	4.108	0.00	
		30.598	0.00	

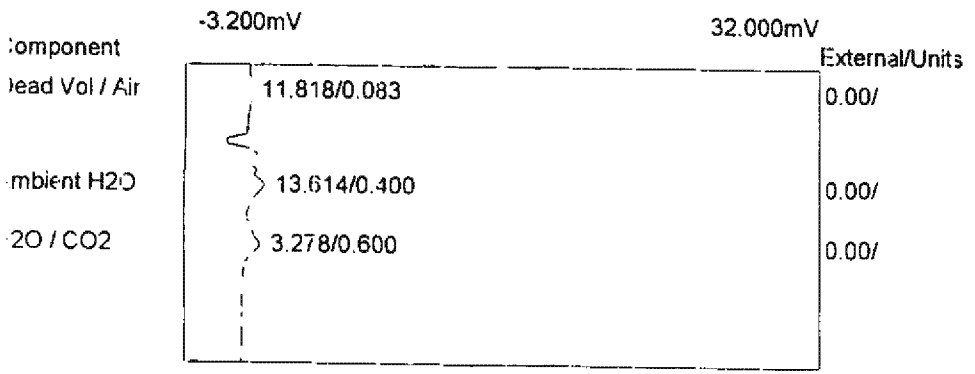
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:04:04
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW5-A03.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	57.531	0.00	
Ethylene Oxide	0.550	23.935	8.62	ppm
		81.466	8.62	

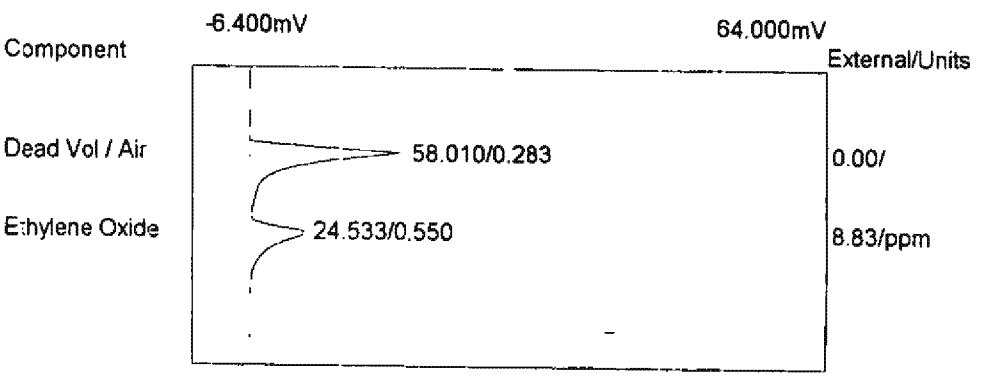
ED_002192_00004534-00109

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:09:20
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW5-A04.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	11.818	0.00	
Ambient H2O	0.400	13.614	0.00	
H2O / CO2	0.600	3.278	0.00	
		28.710	0.00	

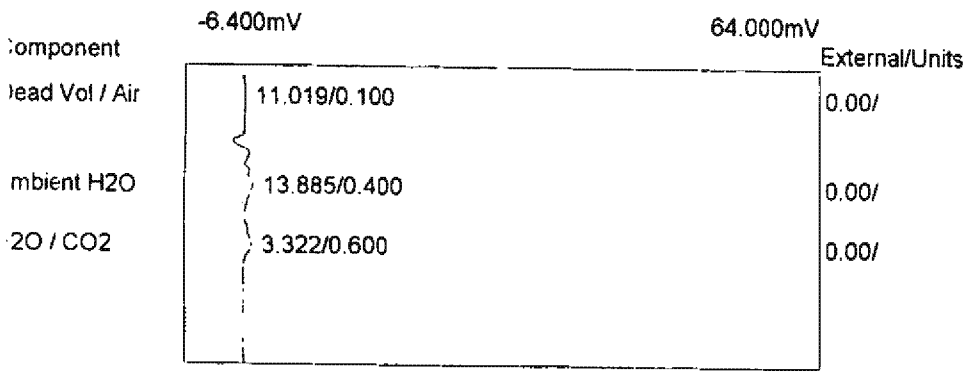
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:09:20
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW5-A04.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	58.010	0.00	
Ethylene Oxide	0.550	24.533	8.83	ppm
		82.543	8.83	

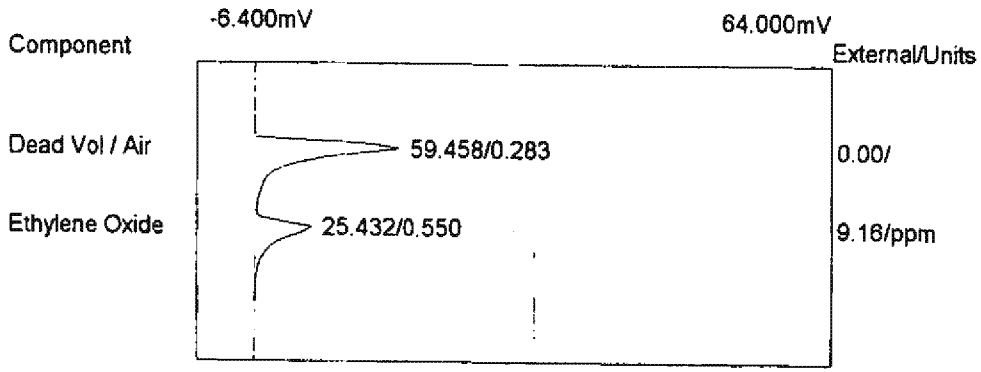
ED_002192_00004534-00110

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:14:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW5-A05.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	11.019	0.00	
Ambient H2O	0.400	13.885	0.00	
H2O / CO2	0.600	3.322	0.00	
		28.226	0.00	

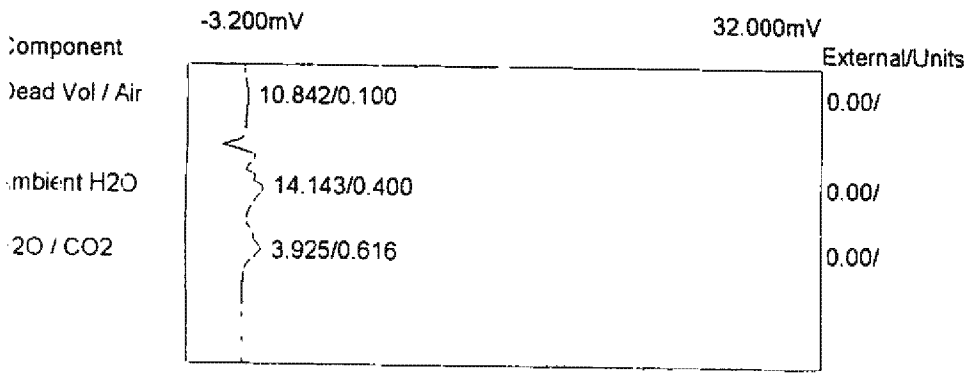
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:14:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW5-A05.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	59.458	0.00	
Ethylene Oxide	0.550	25.432	9.16	ppm
		84.890	9.16	

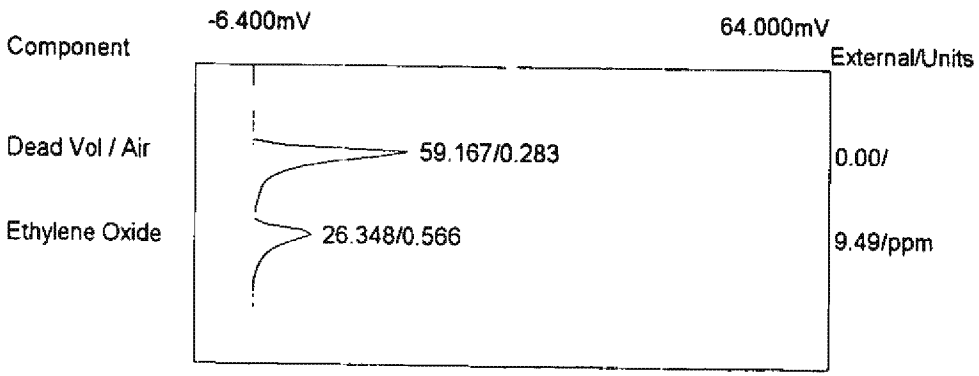
ED_002192_00004534-00111

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Ana ysis date: 01/23/2003 21:19:05
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW5-A06.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



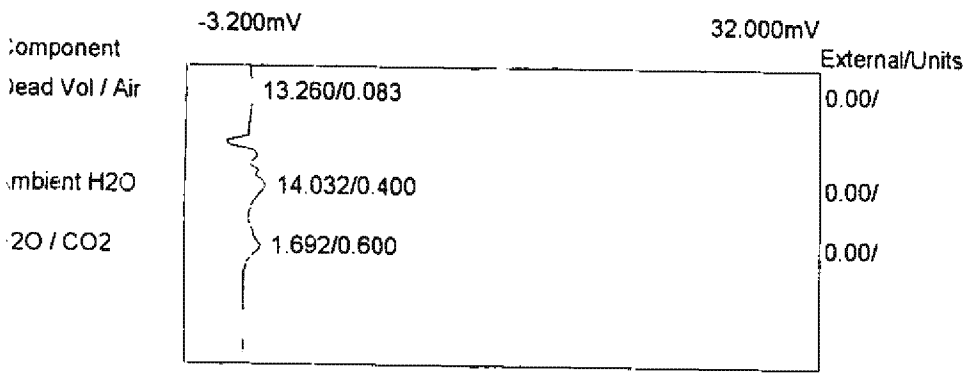
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	10.842	0.00	
Ambient H2O	0.400	14.143	0.00	
H2O / CO2	0.616	3.925	0.00	
		28.910	0.00	

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:19:05
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW5-A06.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



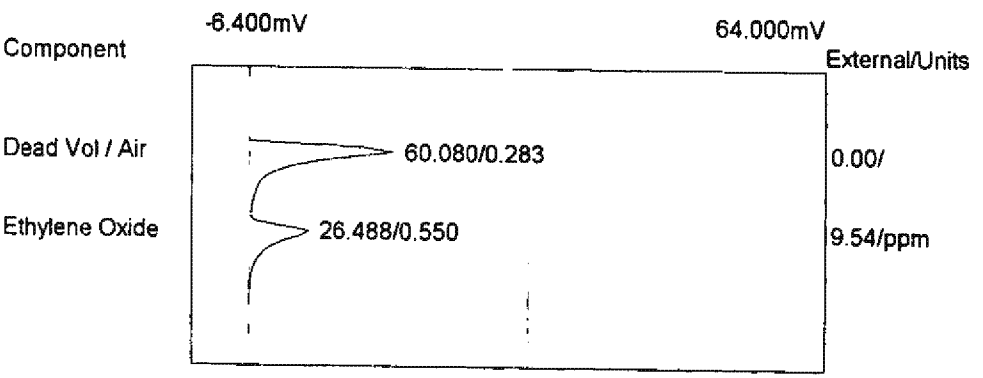
Component	Retention	Area	External	Units
Dead Vol / Air	0.283	59.167	0.00	
Ethylene Oxide	0.566	26.348	9.49	ppm
		85.515	9.49	

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:24:19
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW5-A07.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



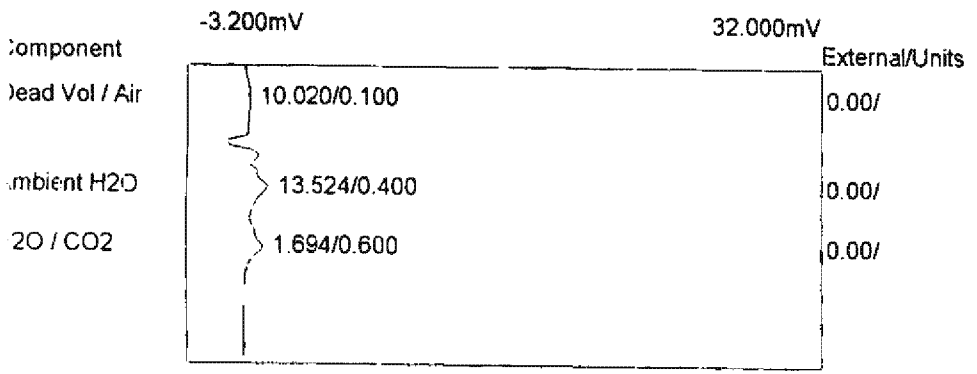
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	13.260	0.00	
Ambient H2O	0.400	14.032	0.00	
H2O / CO2	0.600	1.692	0.00	
		28.984	0.00	

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:24:19
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW5-A07.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



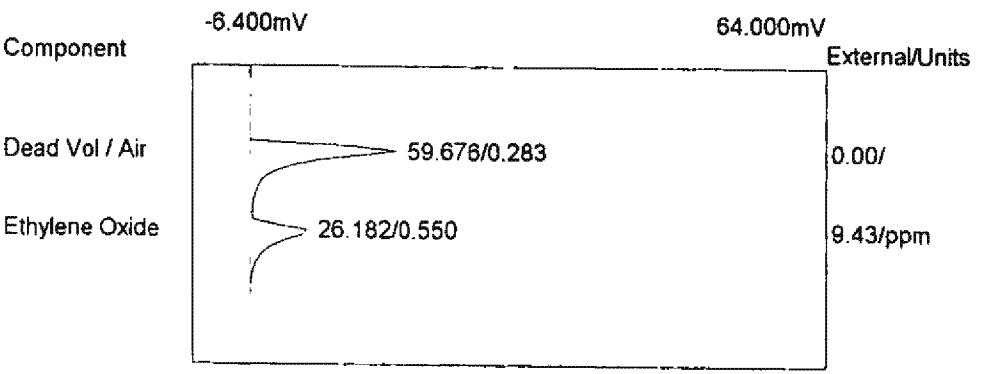
Component	Retention	Area	External	Units
Dead Vol / Air	0.283	60.080	0.00	
Ethylene Oxide	0.550	26.488	9.54	ppm
		86.568	9.54	

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:29:02
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW5-A08.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	10.020	0.00	
Ambient H2O	0.400	13.524	0.00	
H2O / CO2	0.600	1.694	0.00	
		25.238	0.00	

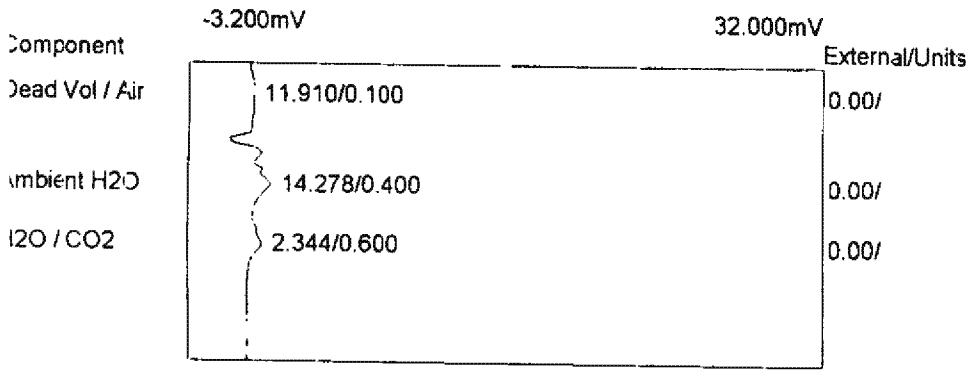
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:29:02
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW5-A08.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	59.676	0.00	
Ethylene Oxide	0.550	26.182	9.43	ppm
		85.858	9.43	

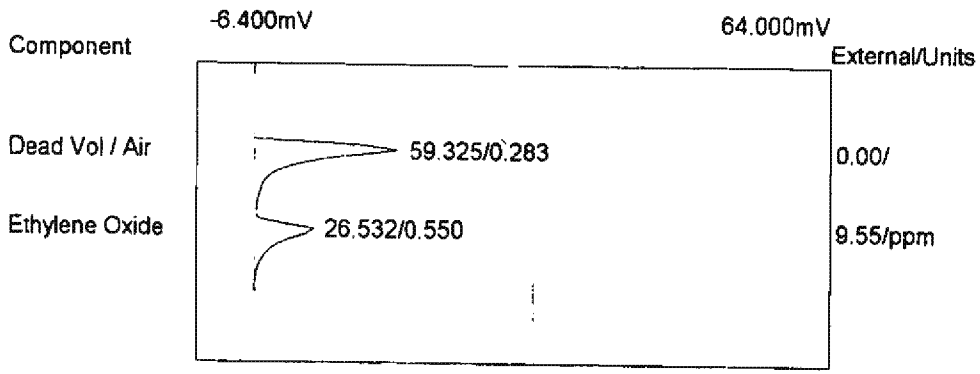
ED_002192_00004534-00114

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:34:12
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW5-A09.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	11.910	0.00	
Ambient H2O	0.400	14.278	0.00	
H2O / CO2	0.600	2.344	0.00	
		28.532	0.00	

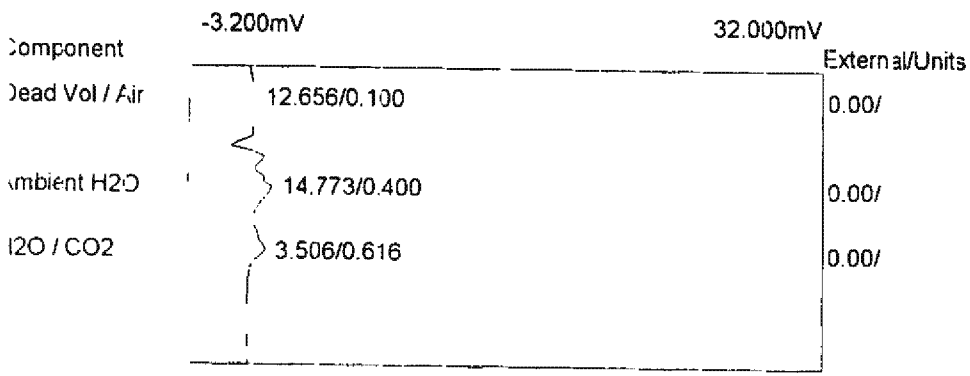
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:34:12
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW5-A09.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	59.325	0.00	
Ethylene Oxide	0.550	26.532	9.55	ppm
		85.857	9.55	

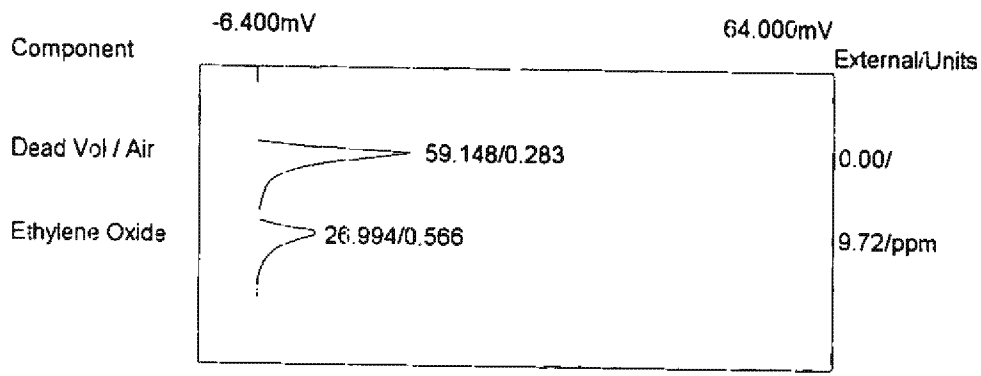
ED_002192_00004534-00115

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:39:10
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW5-A10.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	12.656	0.00	
Ambient H2O	0.400	14.773	0.00	
H2O / CO2	0.616	3.506	0.00	
		30.935	0.00	

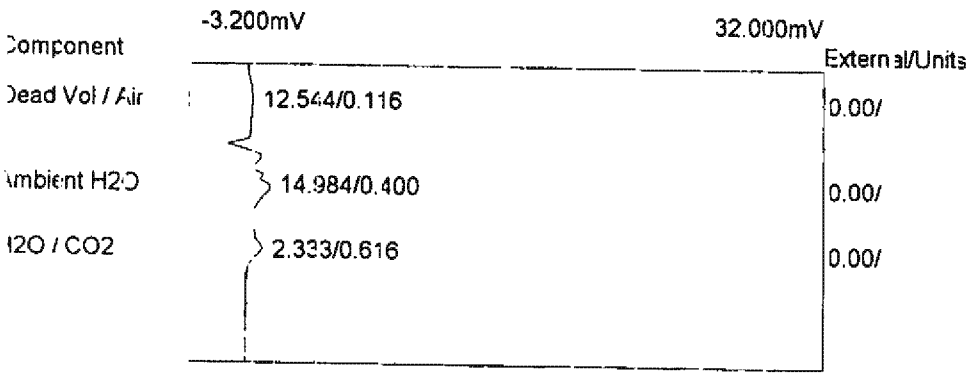
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:39:10
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW5-A10.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	59.148	0.00	
Ethylene Oxide	0.566	26.994	9.72	ppm
		86.142	9.72	

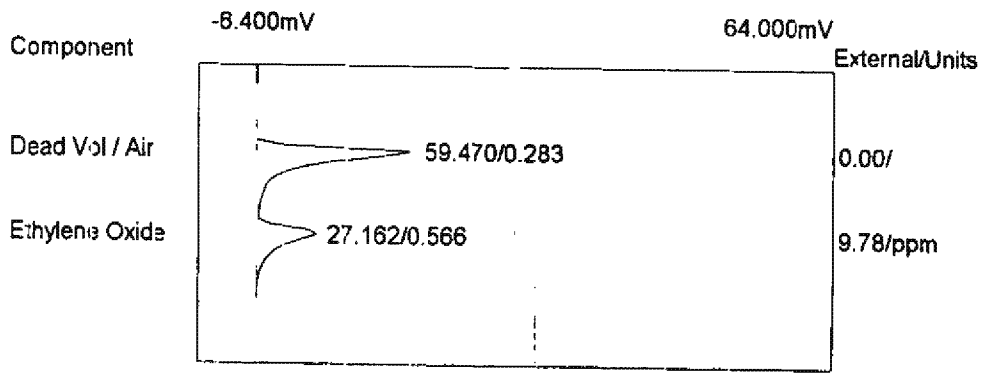
ED_002192_00004534-00116

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:44:09
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW5-A11.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.116	12.544	0.00	
Ambient H2O	0.400	14.984	0.00	
H2O / CO2	0.616	2.333	0.00	
		29.861	0.00	

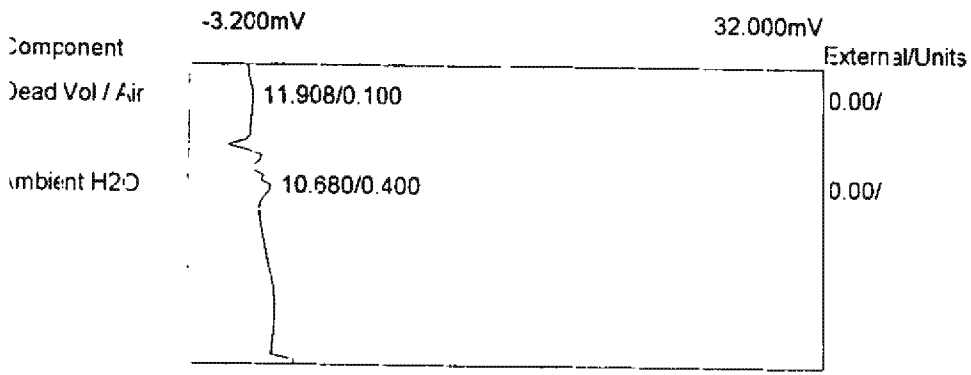
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:44:09
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW5-A11.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	59.470	0.00	
Ethylene Oxide	0.566	27.162	9.78	ppm
		86.632	9.78	

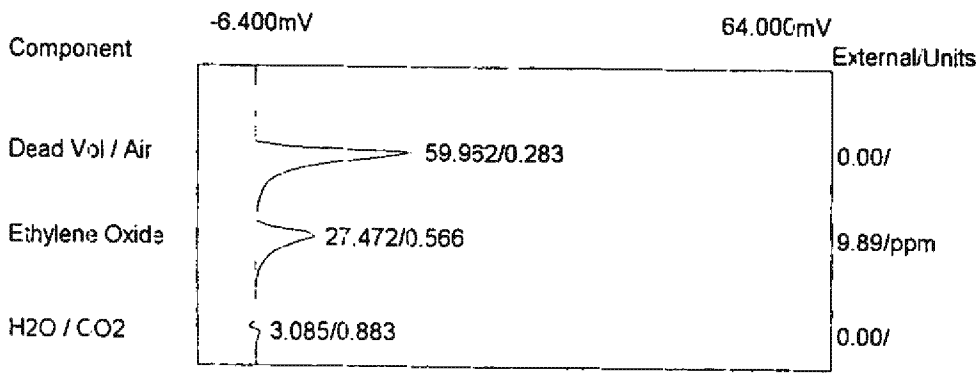
ED_002192_00004534-00117

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:49:06
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW5-A12.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	11.908	0.00	
Ambient H2O	0.400	10.680	0.00	
		22.588	0.00	

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#5Aer
Analysis date: 01/23/2003 21:49:06
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW5-A12.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



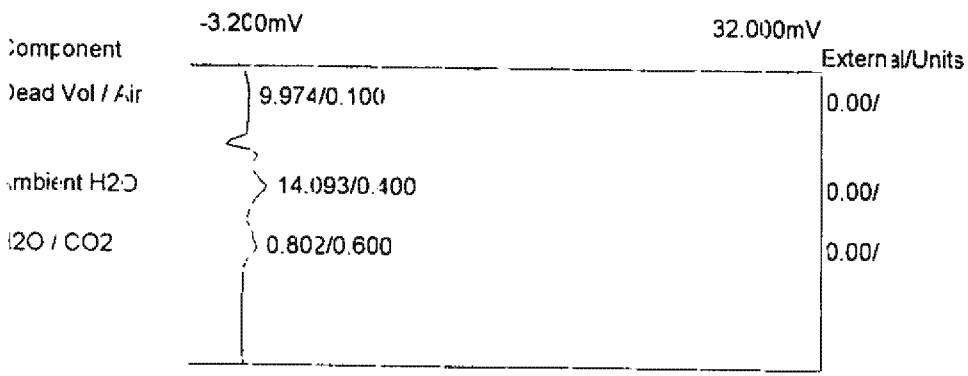
Component	Retention	Area	External	Units
Dead Vol / Air	0.283	59.962	0.00	
Ethylene Oxide	0.566	27.472	9.89	ppm
H2O / CO2	0.883	3.085	0.00	
		90.519	9.89	

ED_002192_00004534-00118

APPENDIX G

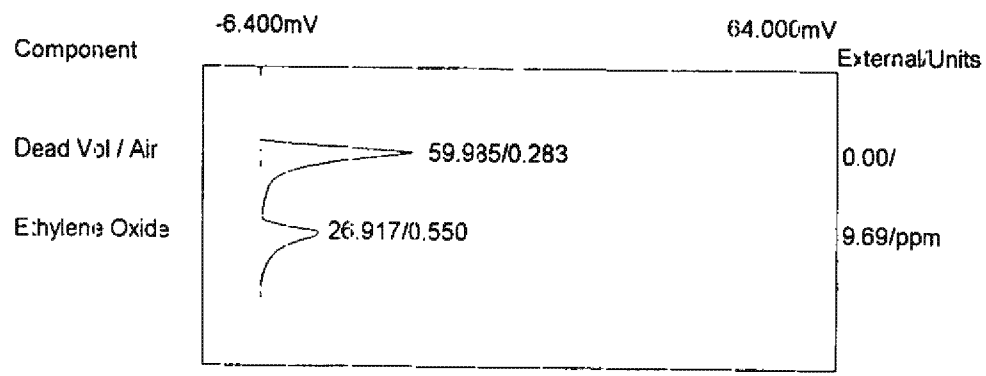
Plant 1 - Run #6 - Aeration Chromatograms - SC2 Only

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 21:54:50
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW6-A01.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	9.974	0.00	
Ambient H2O	0.400	14.093	0.00	
H2O / CO2	0.600	0.802	0.00	
		24.869	0.00	

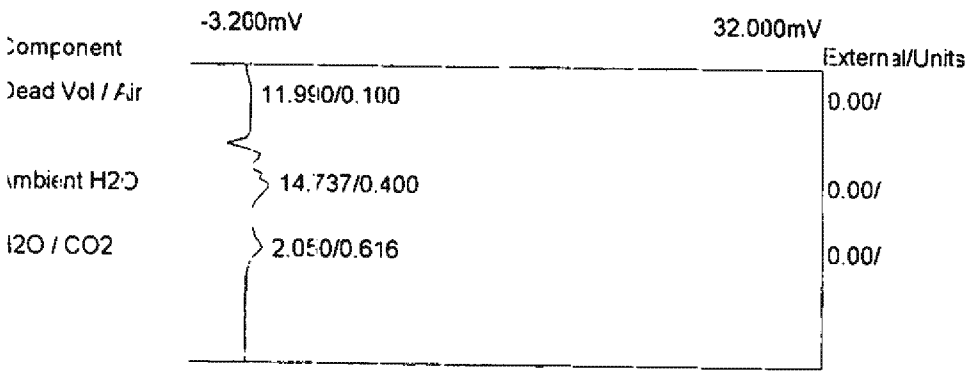
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 21:54:50
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW6-A01.CHR (c:\peakwin)
Sample: SC2 inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	59.985	0.00	
Ethylene Oxide	0.550	26.917	9.69	ppm
		86.902	9.69	

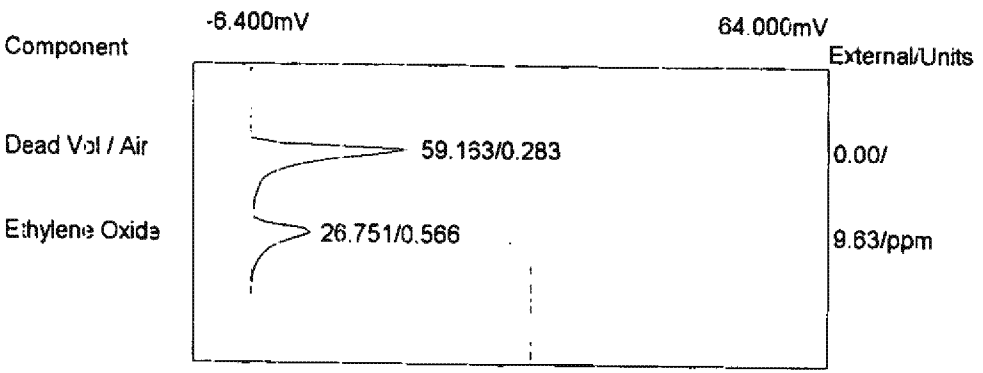
ED_002192_00004534-00120

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 21:59:14
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW6-A02.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	11.990	0.00	
Ambient H2O	0.400	14.737	0.00	
H2O / CO2	0.616	2.050	0.00	
		28.777	0.00	

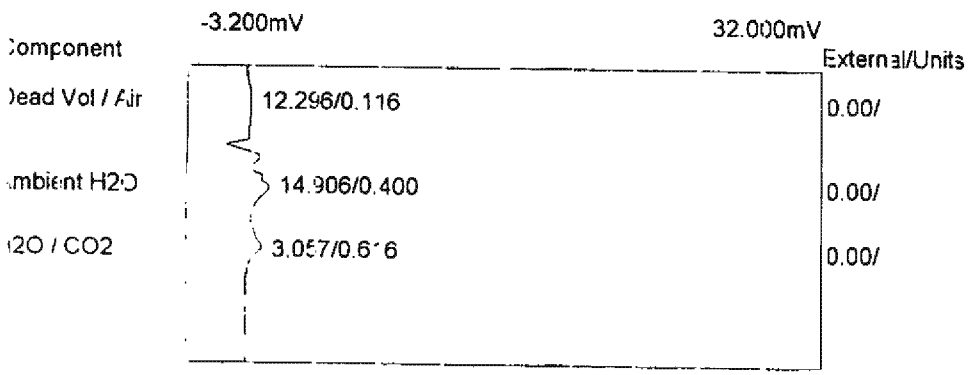
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 21:59:14
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW6-A02.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	59.163	0.00	
Ethylene Oxide	0.566	26.751	9.63	ppm
		85.914	9.63	

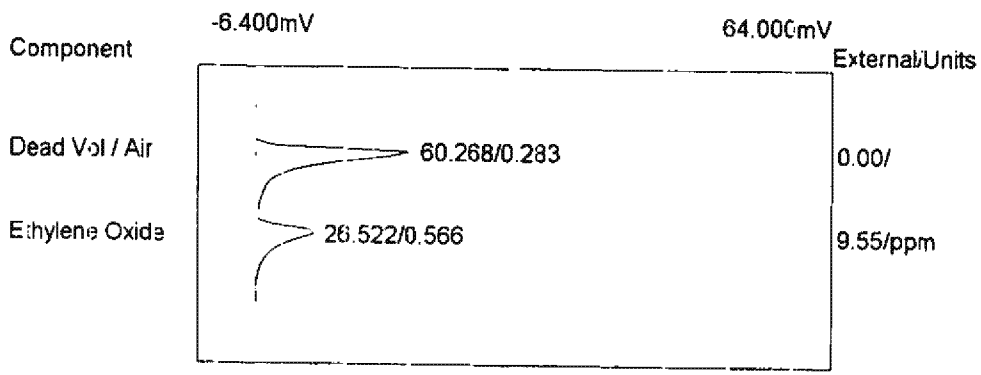
ED_002192_00004534-00121

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:04:10
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW6-A03.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.116	12.296	0.00	
Ambient H2O	0.400	14.906	0.00	
H2O / CC2	0.616	3.057	0.00	
		30.259	0.00	

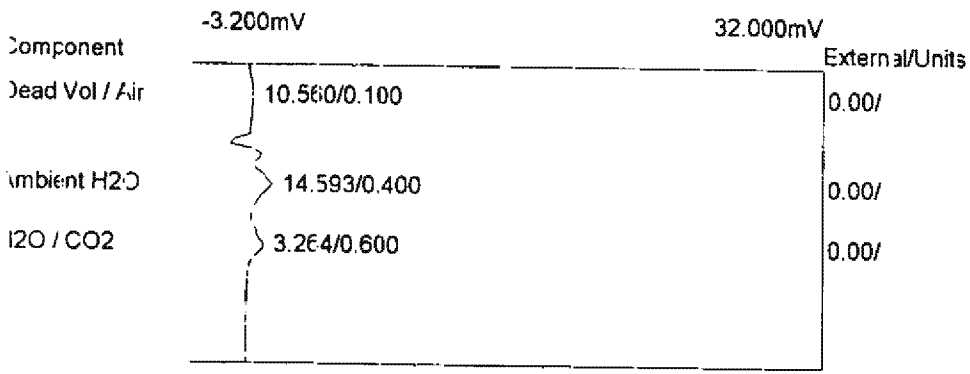
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:04:10
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW6-A03.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	60.268	0.00	
Ethylene Oxide	0.566	26.522	9.55	ppm
		86.790	9.55	

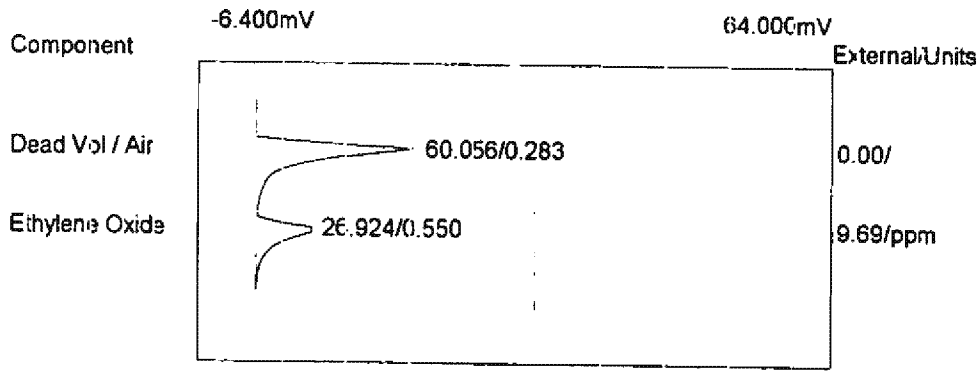
ED_002192_00004534-00122

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:09:27
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW6-A04.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



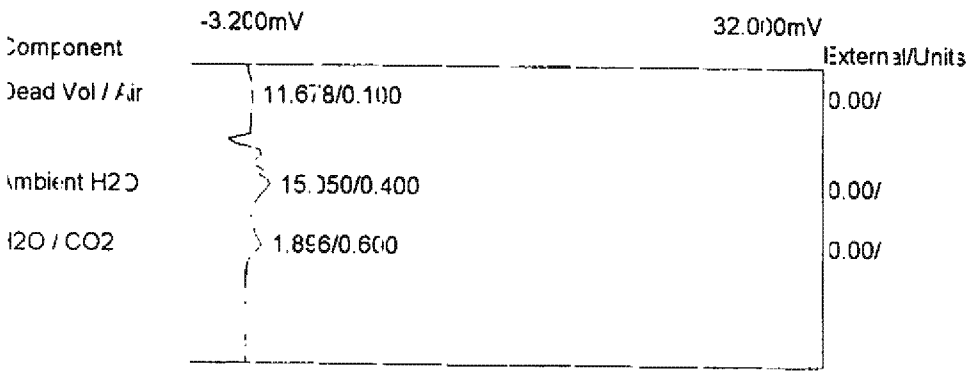
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	10.560	0.00	
Ambient H2O	0.400	14.593	0.00	
H2O / CO2	0.600	3.264	0.00	
		28.417	0.00	

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:09:27
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW6-A04.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



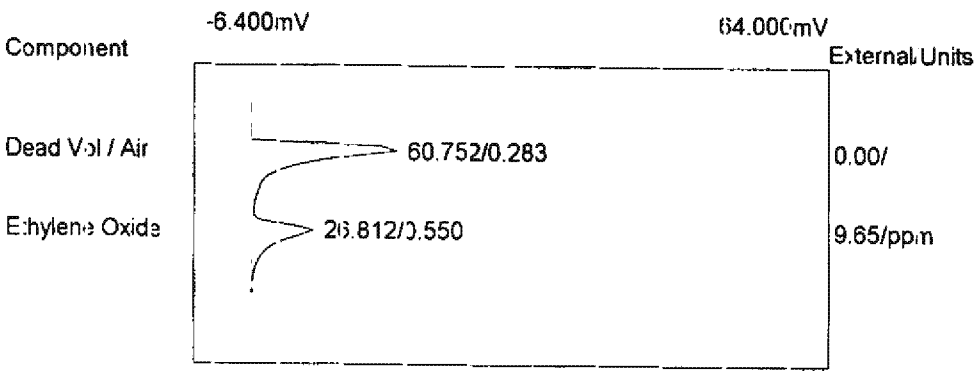
Component	Retention	Area	External	Units
Dead Vol / Air	0.283	60.056	0.00	
Ethylene Oxide	0.550	26.924	9.69	ppm
		86.980	9.69	

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:14:22
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW6-A05.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	11.678	0.00	
Ambient H2O	0.400	15.050	0.00	
H2O / CO2	0.600	1.896	0.00	
		28.624	0.00	

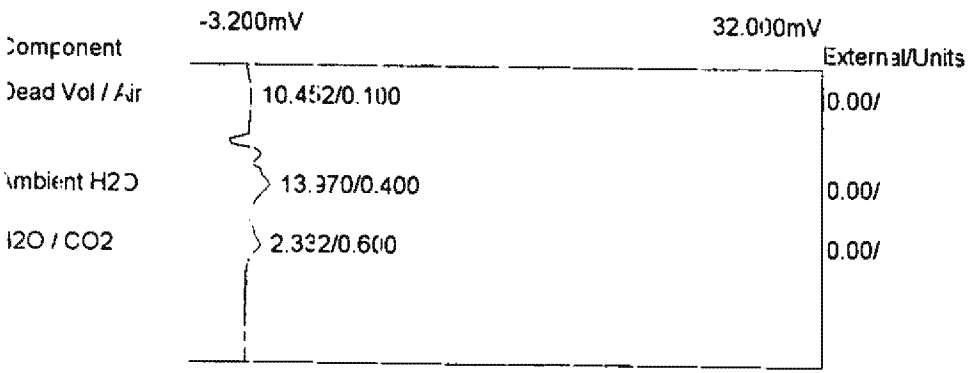
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:14:22
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW6-A05.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	60.752	0.00	
Ethylene Oxide	0.550	26.812	9.65	ppm
		87.564	9.65	

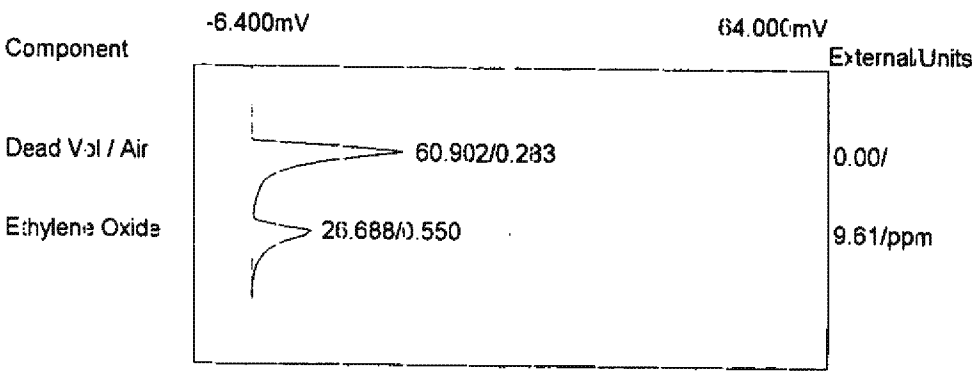
ED_002192_00004534-00124

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:19:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW6-A06.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	10.452	0.00	
Ambient H2O	0.400	13.970	0.00	
H2O / CO2	0.600	2.332	0.00	
		26.754	0.00	

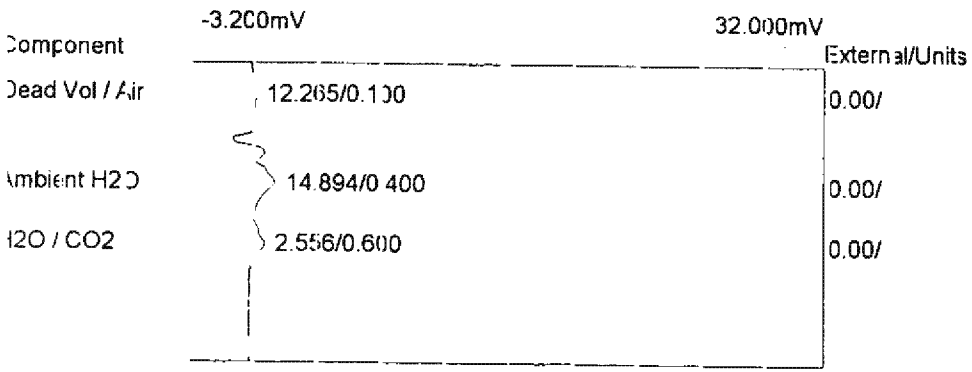
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:19:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW6-A06.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	60.902	0.00	
Ethylene Oxide	0.550	26.688	9.61	ppm
		87.590	9.61	

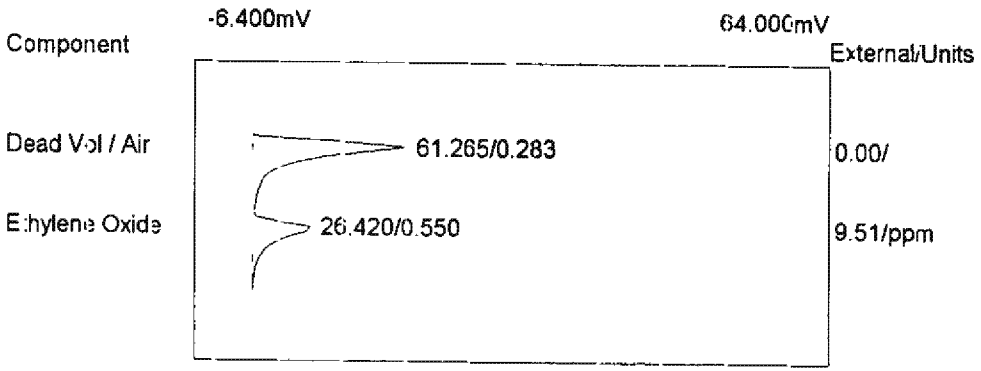
ED_002192_00004534-00125

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:24:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW6-A07.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	12.265	0.00	
Ambient H2O	0.400	14.894	0.00	
H2O / CO2	0.600	2.556	0.00	
		29.715	0.00	

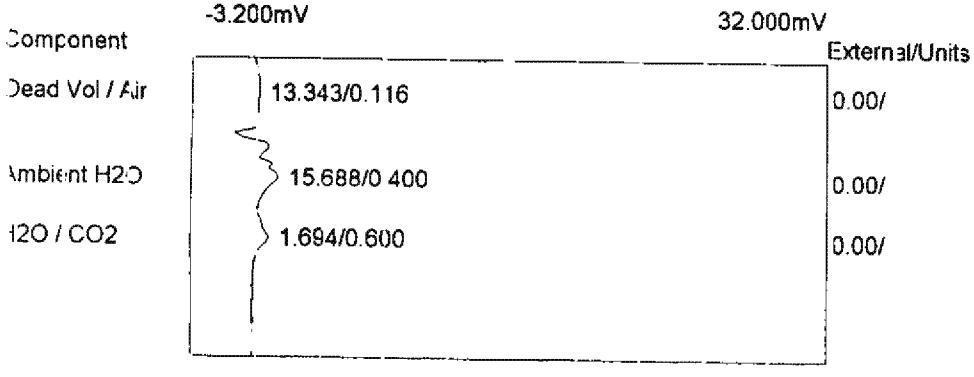
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:24:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW6-A07.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	61.265	0.00	
Ethylene Oxide	0.550	26.420	9.51	ppm
		87.685	9.51	

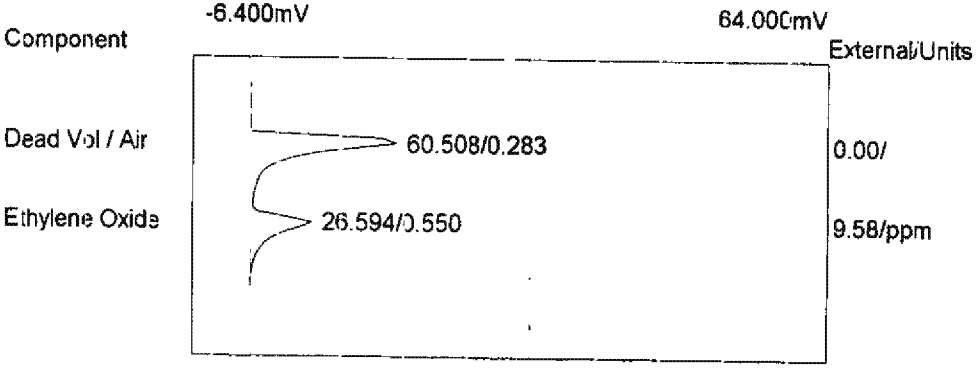
ED_002192_00004534-00126

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:29:05
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW6-A08.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.116	13.343	0.00	
Ambient H2O	0.400	15.688	0.00	
H2O / CO2	0.600	1.694	0.00	
		30.725	0.00	

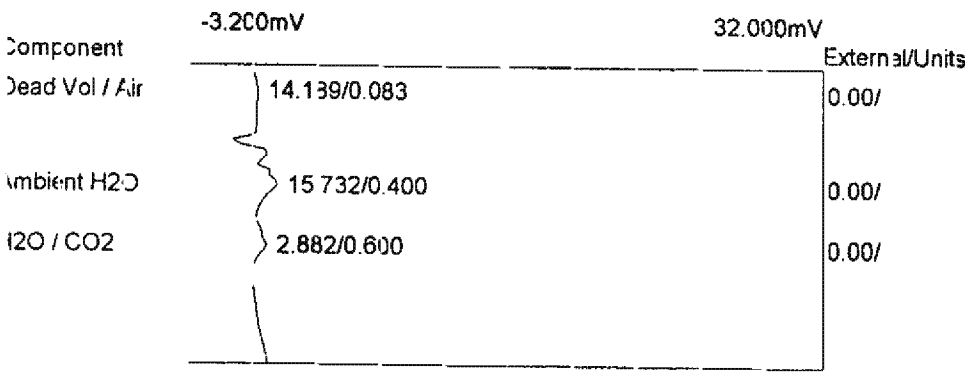
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:29:05
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW6-A08.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	60.508	0.00	
Ethylene Oxide	0.550	26.594	9.58	ppm
		87.102	9.58	

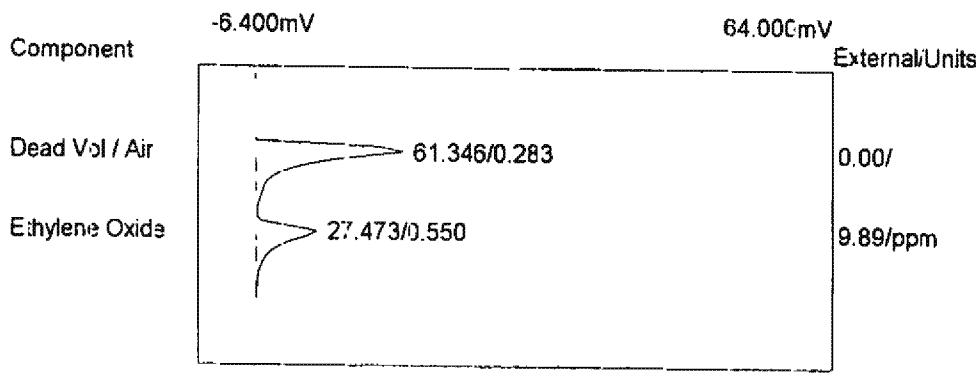
ED_002192_00004534-00127

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:34:56
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW6-A09.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	14.189	0.00	
Ambient H2O	0.400	15.732	0.00	
H2O / CO2	0.600	2.882	0.00	
		32.803	0.00	

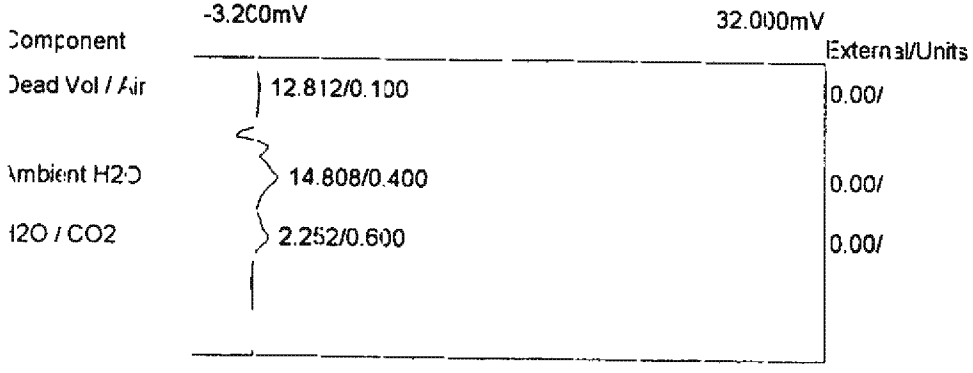
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:34:56
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW6-A09.CHR (c:\peakwin)
Sample: SC2 inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	61.346	0.00	
Ethylene Oxide	0.550	27.473	9.89	ppm
		88.819	9.89	

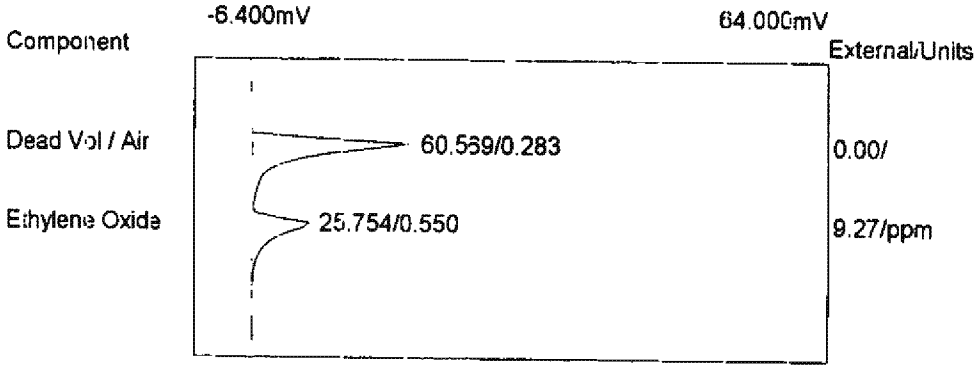
ED_002192_00004534-00128

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:39:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW6-A10.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	12.812	0.00	
Ambient H2O	0.400	14.808	0.00	
H2O / CO2	0.600	2.252	0.00	
		29.872	0.00	

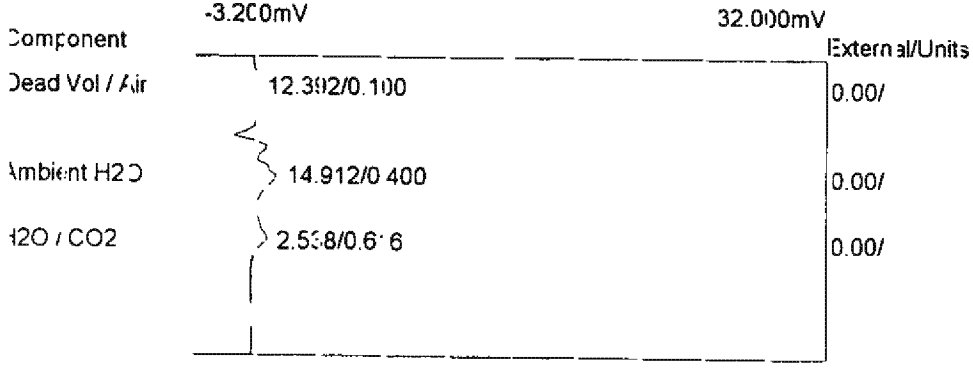
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:39:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW6-A10.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	60.569	0.00	
Ethylene Oxide	0.550	25.754	9.27	ppm
		86.323	9.27	

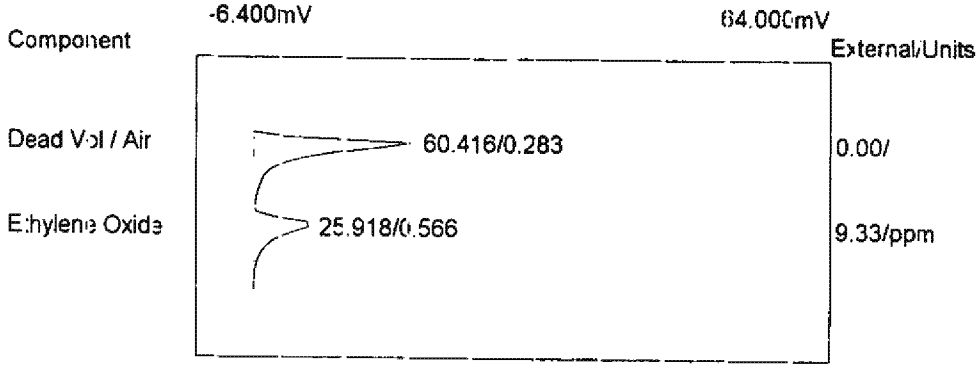
ED_002192_00004534-00129

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:44:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW6-A11.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	12.392	0.00	
Ambient H2O	0.400	14.912	0.00	
H2O / CO2	0.616	2.538	0.00	
		29.842	0.00	

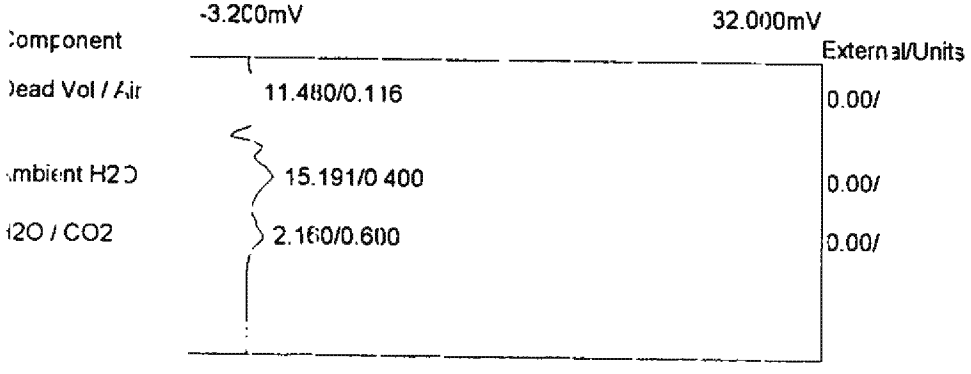
Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:44:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW6-A11.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	60.416	0.00	
Ethylene Oxide	0.566	25.918	9.33	ppm
		86.334	9.33	

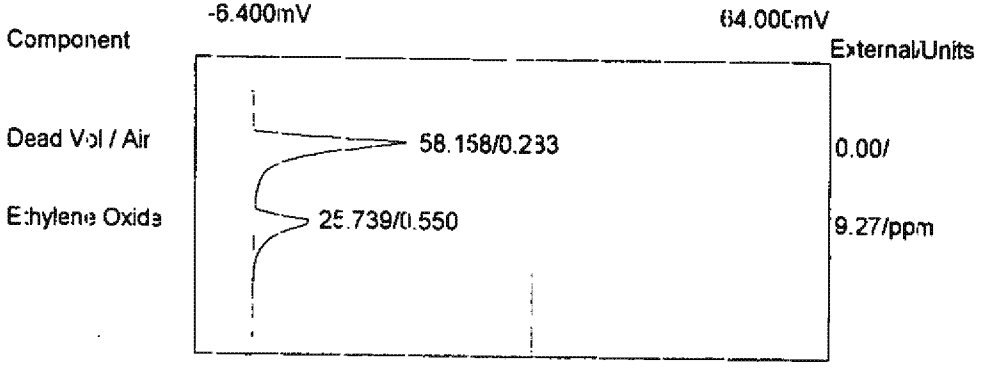
ED_002192_00004534-00130

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:49:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GW6-A12.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.116	11.480	0.00	
Ambient H2O	0.400	15.191	0.00	
H2O / CO2	0.600	2.160	0.00	
		28.831	0.00	

Client: IBA/Griffith, Willowbrook 1
Client ID: Run#6Aer
Analysis date: 01/23/2003 22:49:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GW6-A12.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer

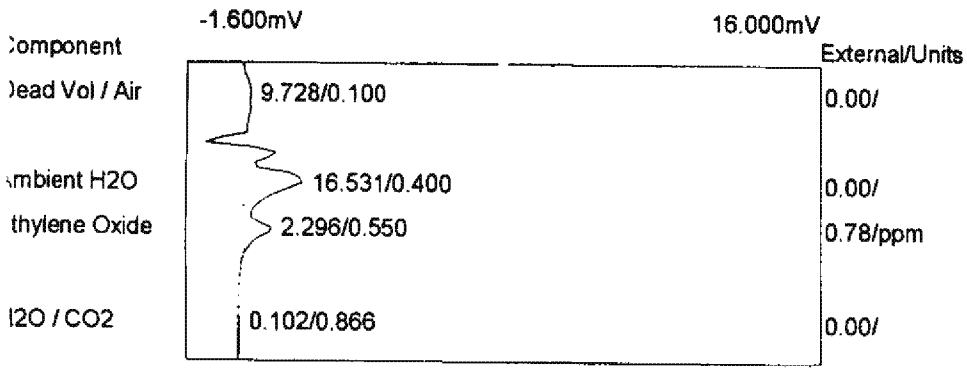


Component	Retention	Area	External	Units
Dead Vol / Air	0.283	58.158	0.00	
Ethylene Oxide	0.550	25.739	9.27	ppm
		83.897	9.27	

APPENDIX H

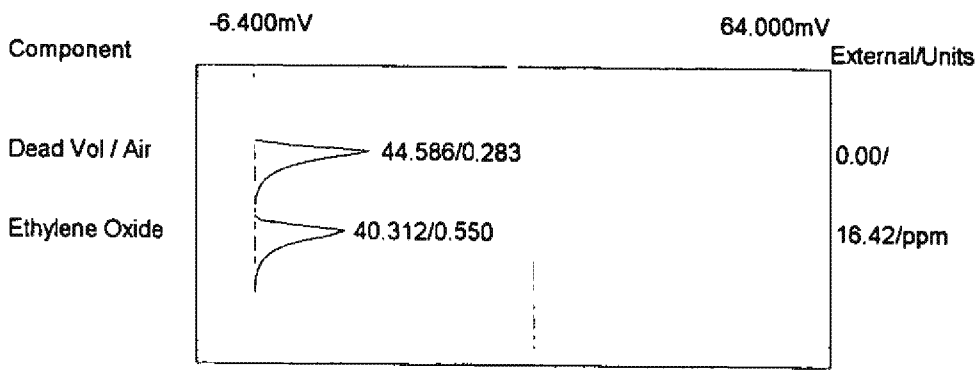
Plant 2 - Run #1 - Aeration Chromatograms - SC1 & SC2

Client: IBAGrimth-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 12:41:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT1-A01.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	9.728	0.00	
Ambient H2O	0.400	16.531	0.00	
Ethylene Oxide	0.550	2.296	0.78	ppm
H2O / CO2	0.866	0.102	0.00	
		28.657	0.78	

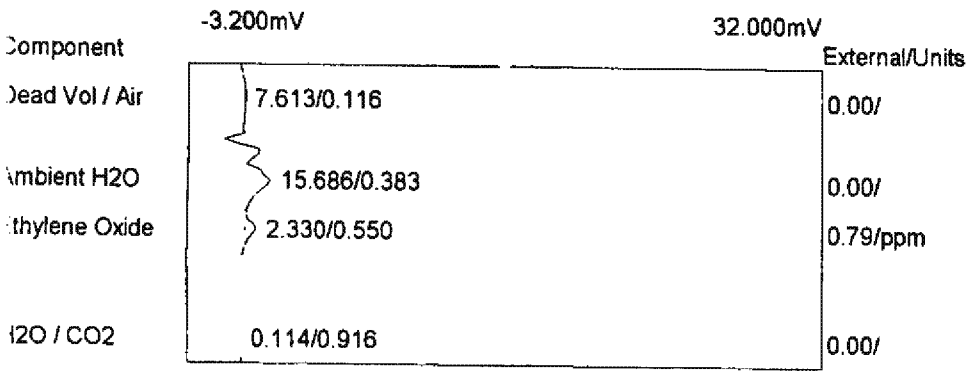
Client: IBAGrimth-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 12:41:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-A01.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	44.586	0.00	
Ethylene Oxide	0.550	40.312	16.42	ppm
		84.898	16.42	

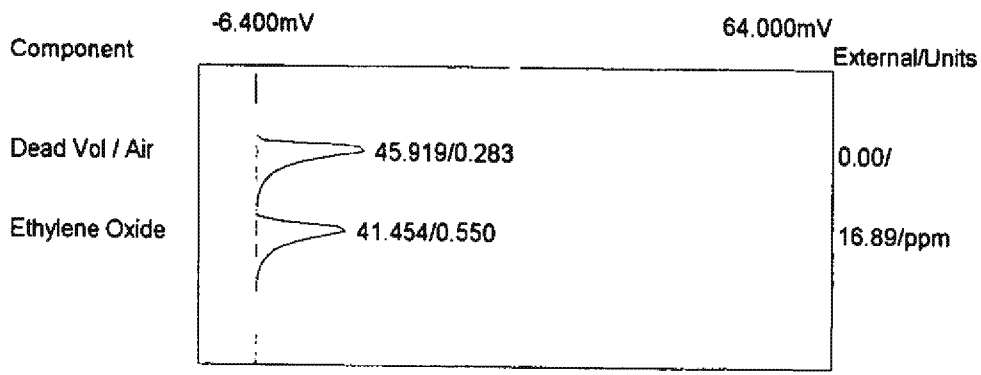
ED_002192_00004534-00133

Client ID: Run#1Aer
Analysis date: 01/24/2003 12:46:02
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT1-A02.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.116	7.613	0.00	
Ambient H2O	0.383	15.686	0.00	
Ethylene Oxide	0.550	2.330	0.79	ppm
H2O / CO2	0.916	0.114	0.00	
		25.743	0.79	

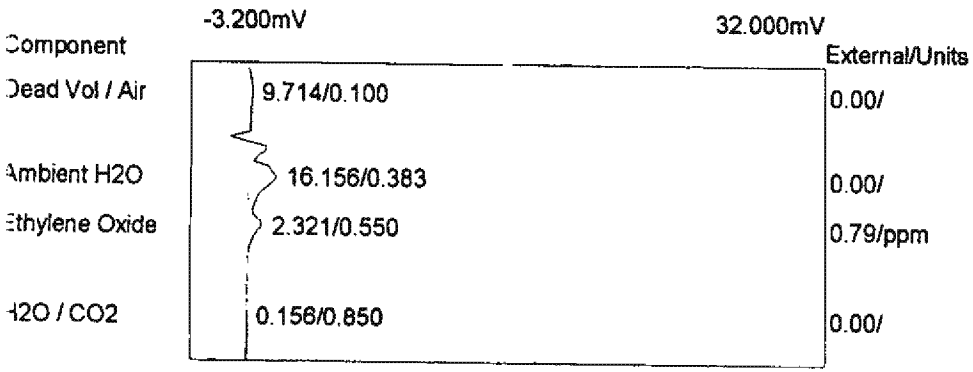
Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 12:46:02
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-A02.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	45.919	0.00	
Ethylene Oxide	0.550	41.454	16.89	ppm
		87.373	16.89	

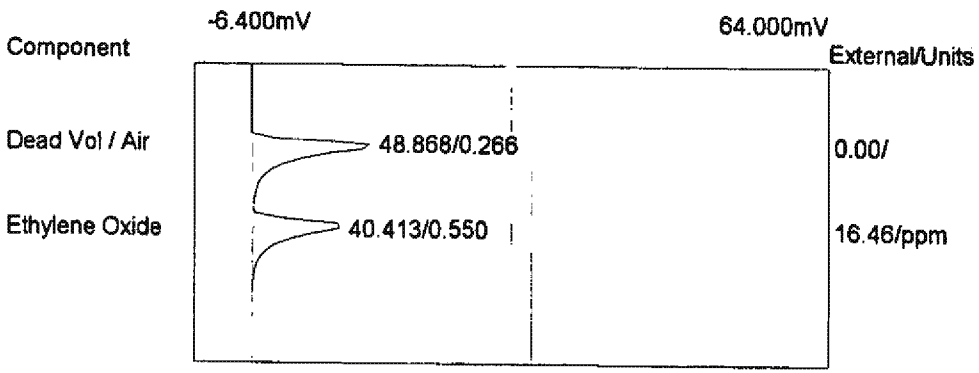
ED_002192_00004534-00134

Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 12:51:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT1-A03.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



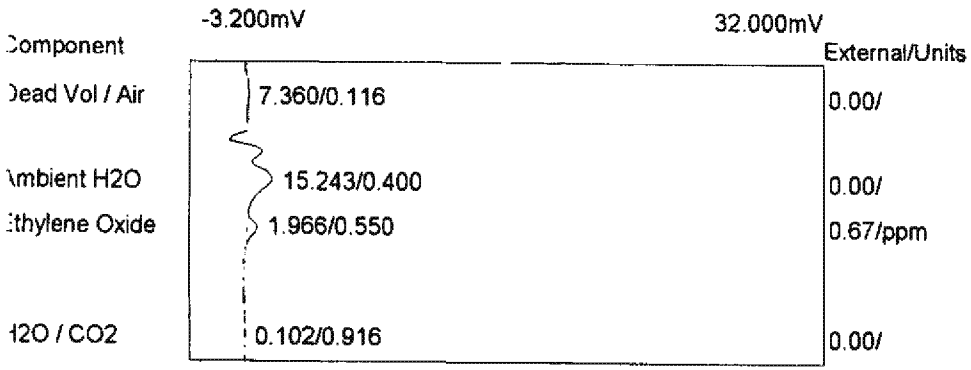
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	9.714	0.00	
Ambient H2O	0.383	16.156	0.00	
Ethylene Oxide	0.550	2.321	0.79	ppm
H2O / CO2	0.850	0.156	0.00	
		28.347	0.79	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 12:51:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-A03.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



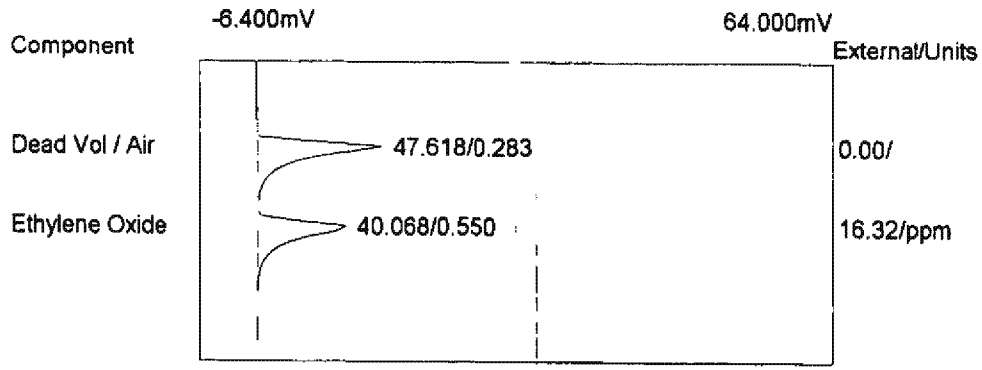
Component	Retention	Area	External	Units
Dead Vol / Air	0.266	48.868	0.00	
Ethylene Oxide	0.550	40.413	16.46	ppm
		89.281	16.46	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 12:56:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT1-A04.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.116	7.360	0.00	
Ambient H2O	0.400	15.243	0.00	
Ethylene Oxide	0.550	1.966	0.67	ppm
H2O / CO2	0.916	0.102	0.00	
		24.671	0.67	

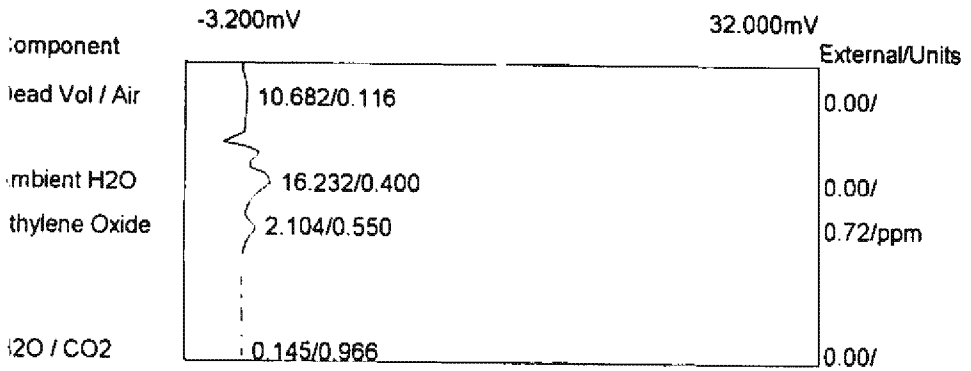
Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 12:56:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-A04.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	47.618	0.00	
Ethylene Oxide	0.550	40.068	16.32	ppm
		87.686	16.32	

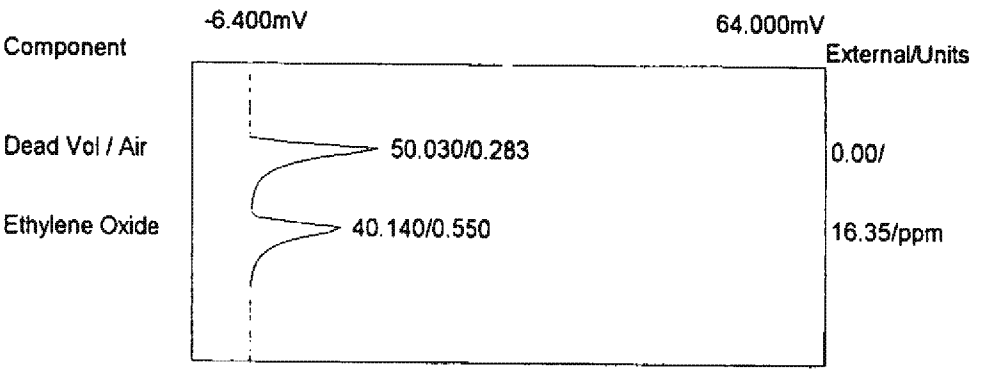
ED_002192_00004534-00136

Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 13:01:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT1-A05.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.116	10.682	0.00	
Ambient H2O	0.400	16.232	0.00	
Ethylene Oxide	0.550	2.104	0.72	ppm
H2O / CO2	0.966	0.145	0.00	
		29.163	0.72	

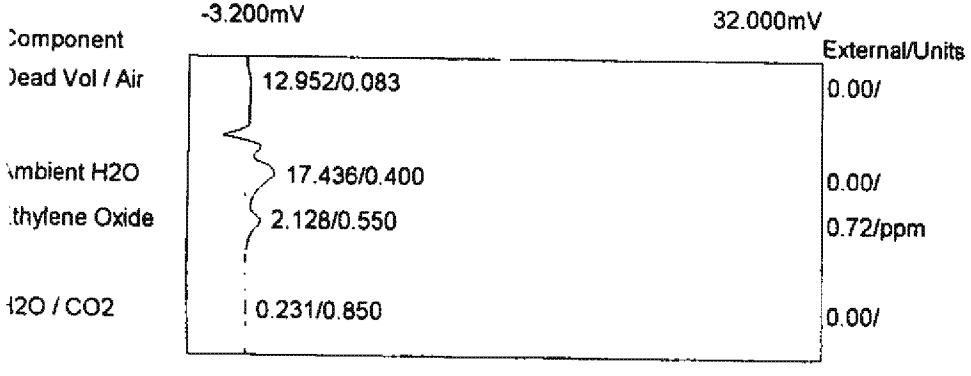
Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 13:01:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-A05.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	50.030	0.00	
Ethylene Oxide	0.550	40.140	16.35	ppm
		90.170	16.35	

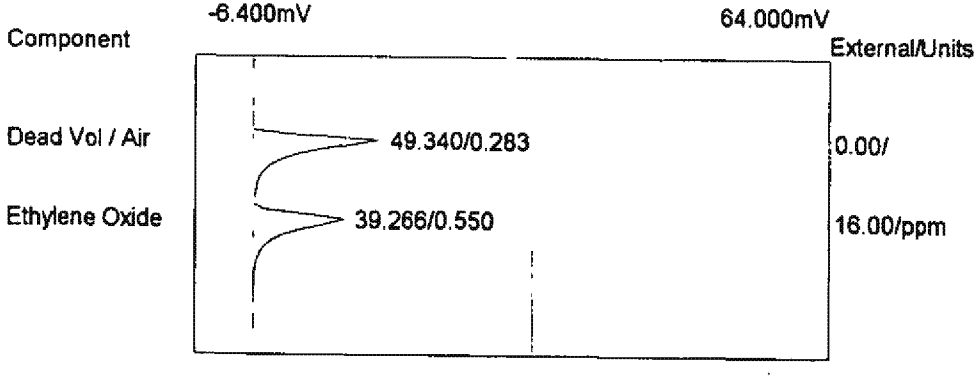
ED_002192_00004534-00137

Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 13:06:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT1-A06.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	12.952	0.00	
Ambient H2O	0.400	17.436	0.00	
Ethylene Oxide	0.550	2.128	0.72	ppm
H2O / CO2	0.850	0.231	0.00	
		32.747	0.72	

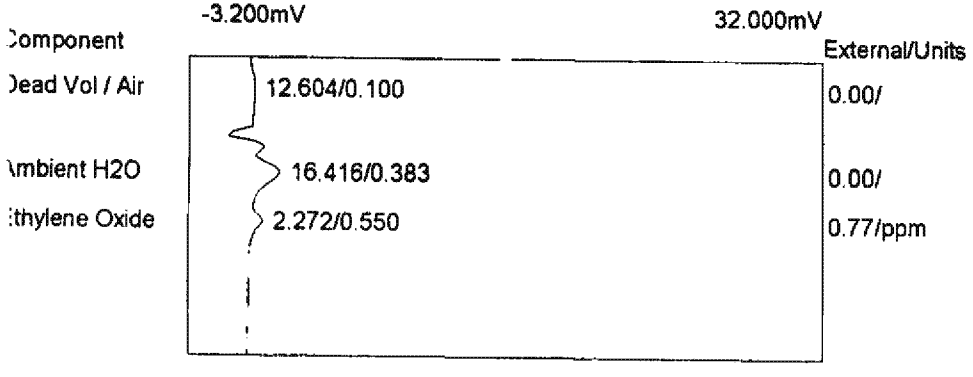
Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 13:06:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-A06.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	49.340	0.00	
Ethylene Oxide	0.550	39.266	16.00	ppm
		88.606	16.00	

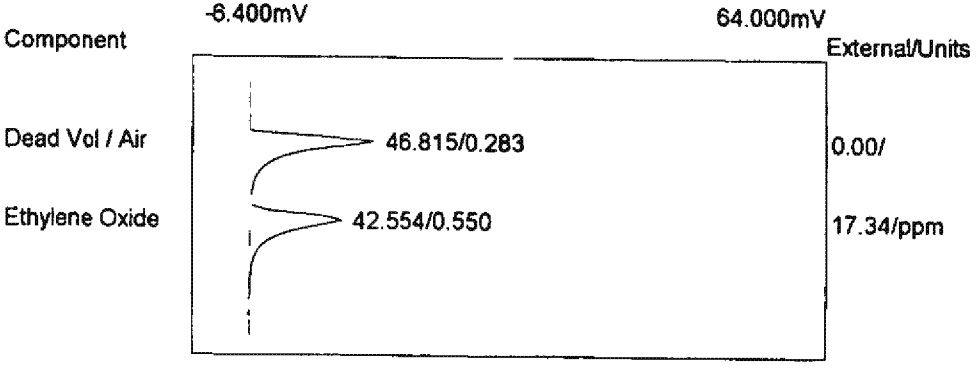
ED_002192_00004534-00138

Client ID: Run#1Aer
Analysis date: 01/24/2003 13:11:05
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT1-A07.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	12.604	0.00	
Ambient H2O	0.383	16.416	0.00	
Ethylene Oxide	0.550	2.272	0.77	ppm
		31.292	0.77	

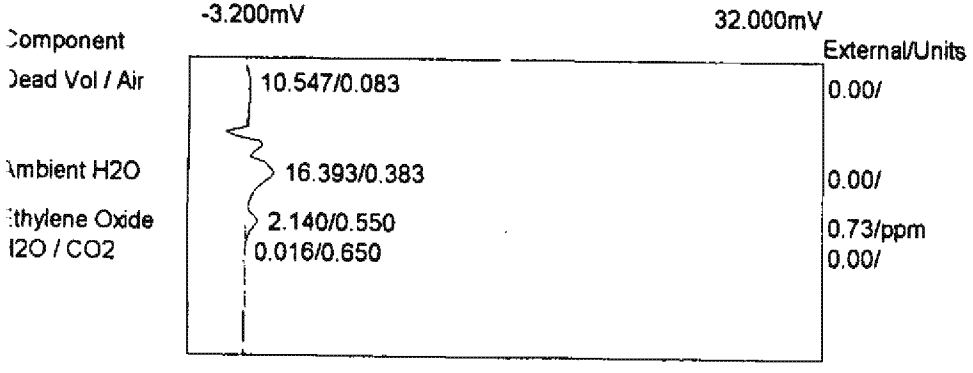
Client ID: Run#1Aer
Analysis date: 01/24/2003 13:11:05
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-A07.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	46.815	0.00	
Ethylene Oxide	0.550	42.554	17.34	ppm
		89.369	17.34	

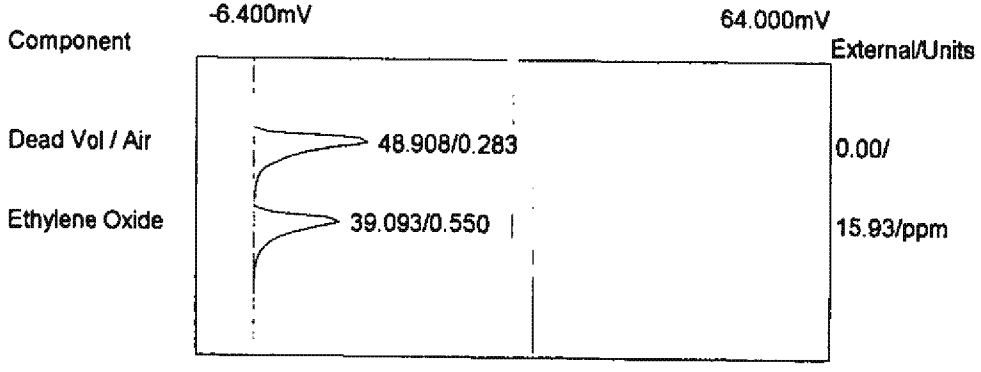
ED_002192_00004534-00139

Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 13:16:12
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT1-A08.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	10.547	0.00	
Ambient H2O	0.383	16.393	0.00	
Ethylene Oxide	0.550	2.140	0.73	ppm
H2O / CO2	0.650	0.016	0.00	
		29.096	0.73	

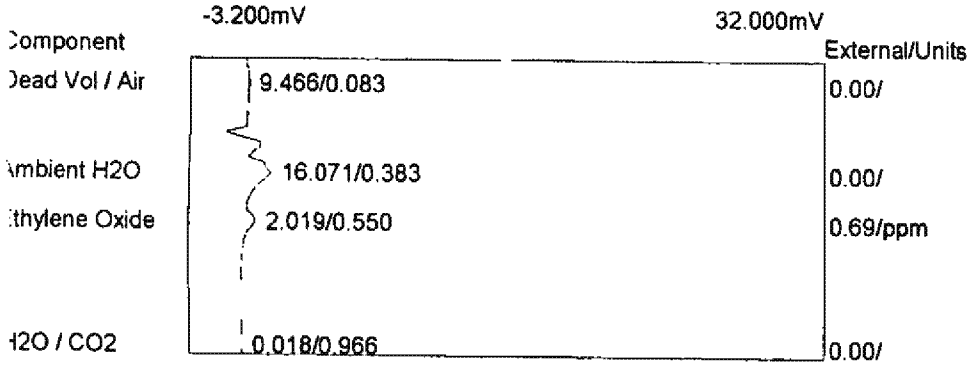
Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 13:16:12
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-A08.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	48.908	0.00	
Ethylene Oxide	0.550	39.093	15.93	ppm
		88.001	15.93	

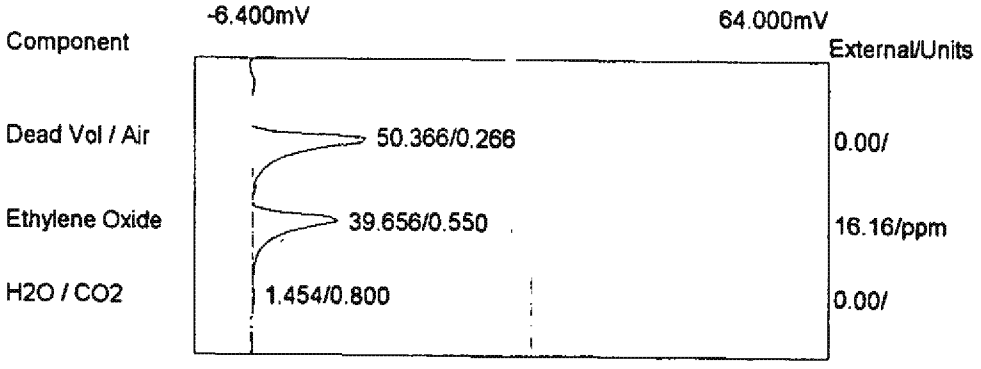
ED_002192_00004534-00140

Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 13:21:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT1-A09.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	9.466	0.00	
Ambient H2O	0.383	16.071	0.00	
Ethylene Oxide	0.550	2.019	0.69	ppm
H2O / CO2	0.966	0.018	0.00	
		27.574	0.69	

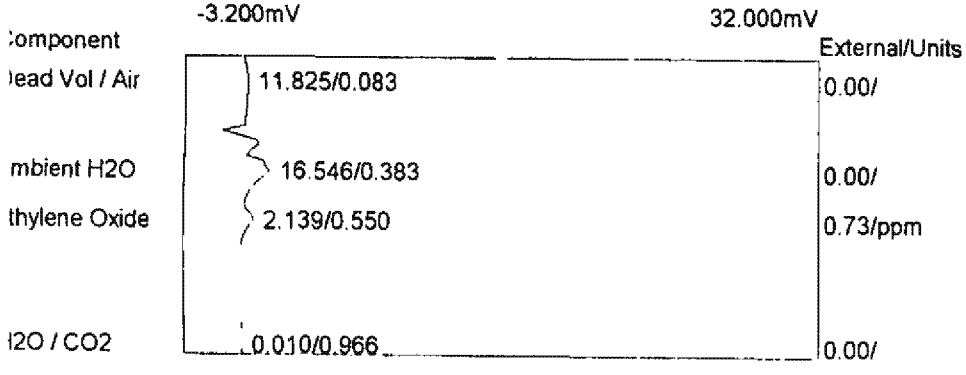
Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 13:21:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-A09.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	50.366	0.00	
Ethylene Oxide	0.550	39.656	16.16	ppm
H2O / CO2	0.800	1.454	0.00	
		91.476	16.16	

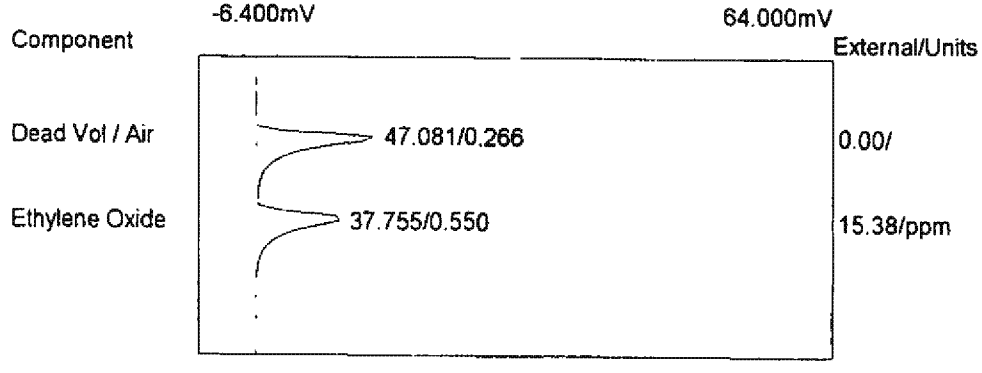
ED_002192_00004534-00141

Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 13:26:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT1-A10.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	11.825	0.00	
Ambient H2O	0.383	16.546	0.00	
Ethylene Oxide	0.550	2.139	0.73	ppm
H2O / CO2	0.966	0.010	0.00	
		30.520	0.73	

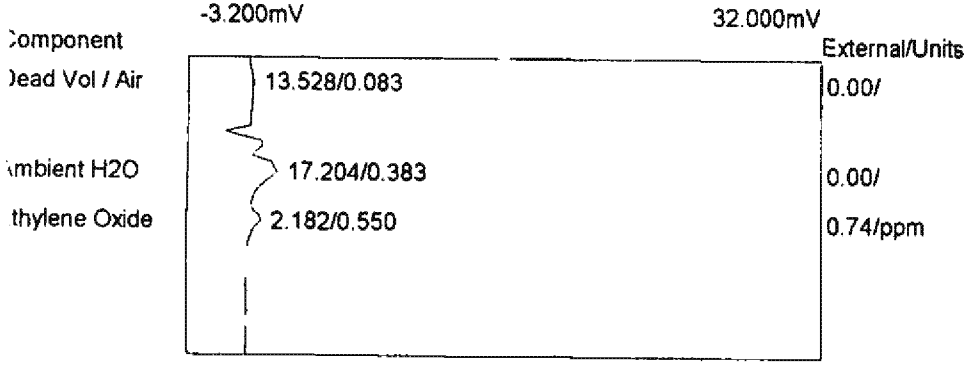
Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 13:26:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-A10.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	47.081	0.00	
Ethylene Oxide	0.550	37.755	15.38	ppm
		84.836	15.38	

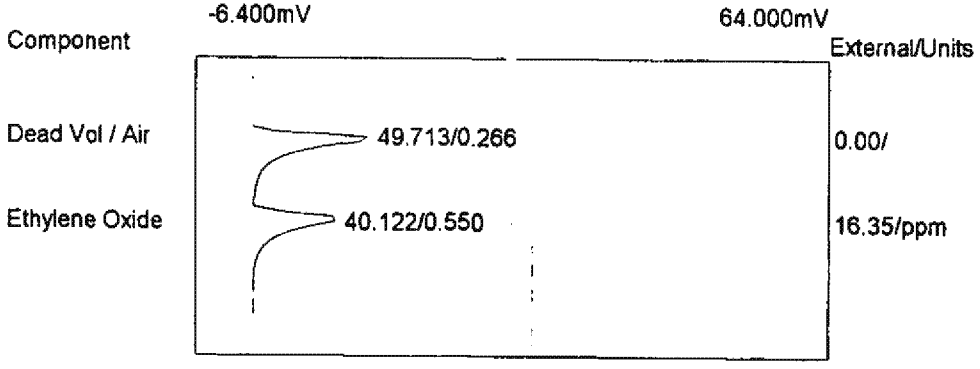
ED_002192_00004534-00142

Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 13:31:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT1-A11.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	13.528	0.00	
Ambient H2O	0.383	17.204	0.00	
Ethylene Oxide	0.550	2.182	0.74	ppm
		32.914	0.74	

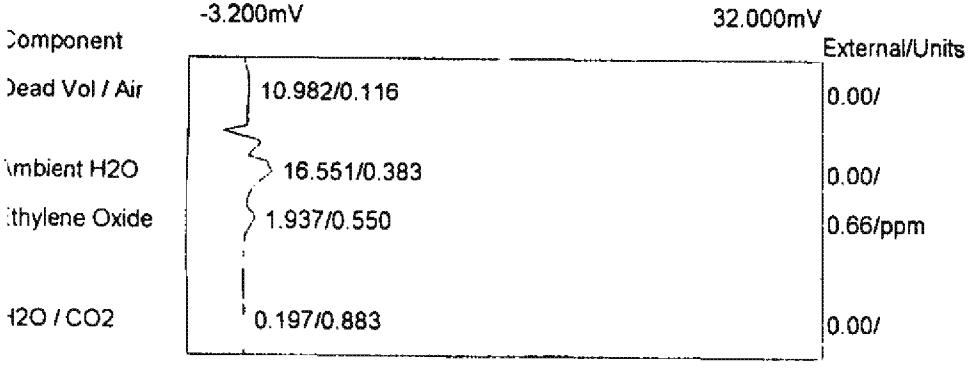
Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 13:31:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-A11.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	49.713	0.00	
Ethylene Oxide	0.550	40.122	16.35	ppm
		89.835	16.35	

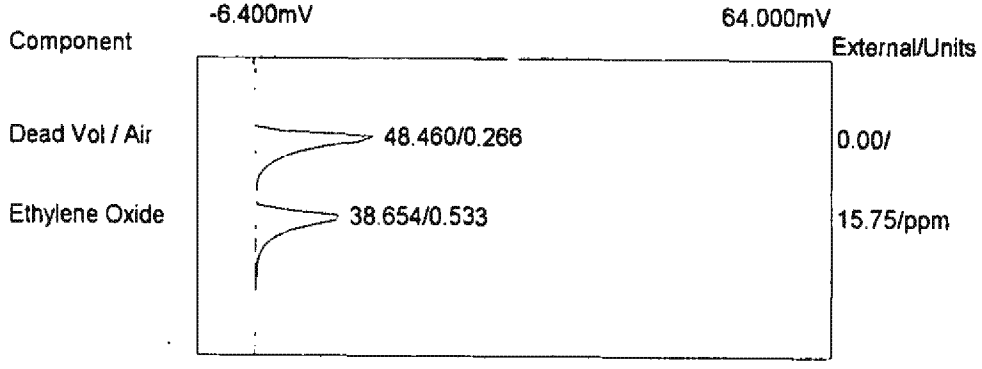
ED_002192_00004534-00143

Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 13:36:03
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT1-A12.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.116	10.982	0.00	
Ambient H2O	0.383	16.551	0.00	
Ethylene Oxide	0.550	1.937	0.66	ppm
H2O / CO2	0.883	0.197	0.00	
		29.667	0.66	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#1Aer
Analysis date: 01/24/2003 13:36:03
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT1-A12.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



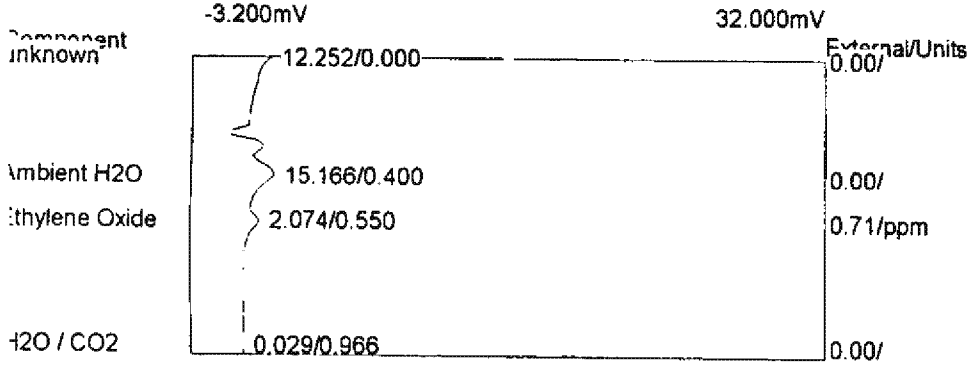
Component	Retention	Area	External	Units
Dead Vol / Air	0.266	48.460	0.00	
Ethylene Oxide	0.533	38.654	15.75	ppm
		87.114	15.75	

ED_002192_00004534-00144

APPENDIX I

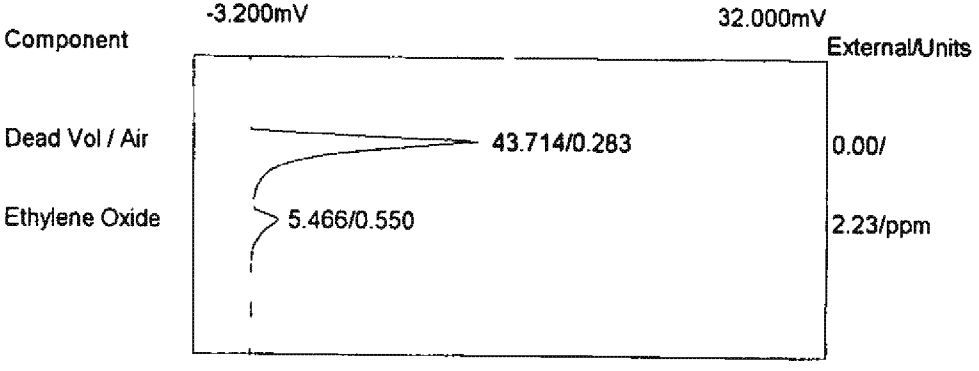
Plant 2 - Run #2 - Aeration Chromatograms - SC2 Only

Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 12:43:21
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-A01.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



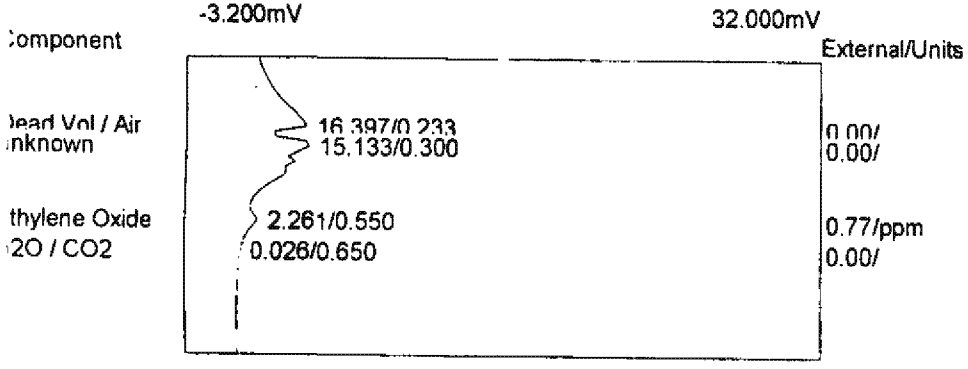
Component	Retention	Area	External	Units
Ambient H2O	0.400	15.166	0.00	
Ethylene Oxide	0.550	2.074	0.71	ppm
H2O / CO2	0.966	0.029	0.00	
		17.269	0.71	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 12:43:21
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT2-A01.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



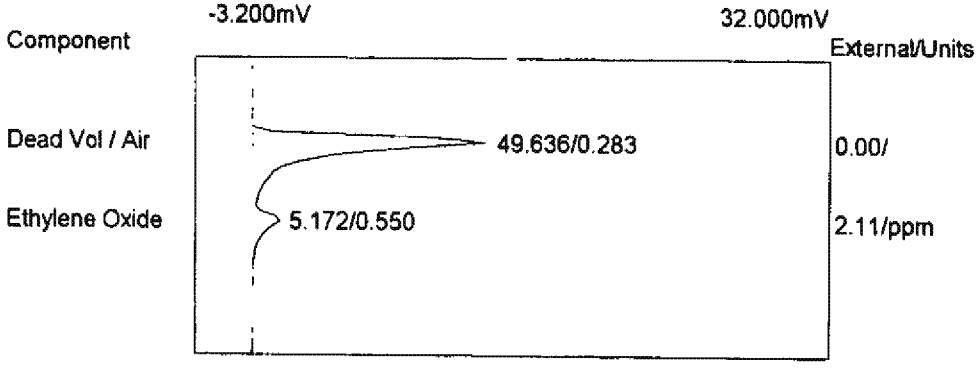
Component	Retention	Area	External	Units
Dead Vol / Air	0.283	43.714	0.00	
Ethylene Oxide	0.550	5.466	2.23	ppm
		49.180	2.23	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 12:48:04
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-A02.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



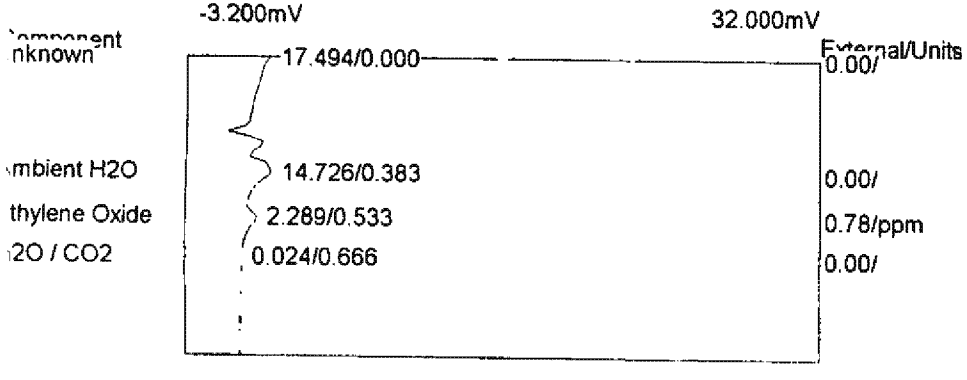
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	16.397	0.00	
Ethylene Oxide	0.550	2.261	0.77	ppm
H2O / CO2	0.650	0.026	0.00	
		18.684	0.77	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 12:48:04
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT2-A02.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



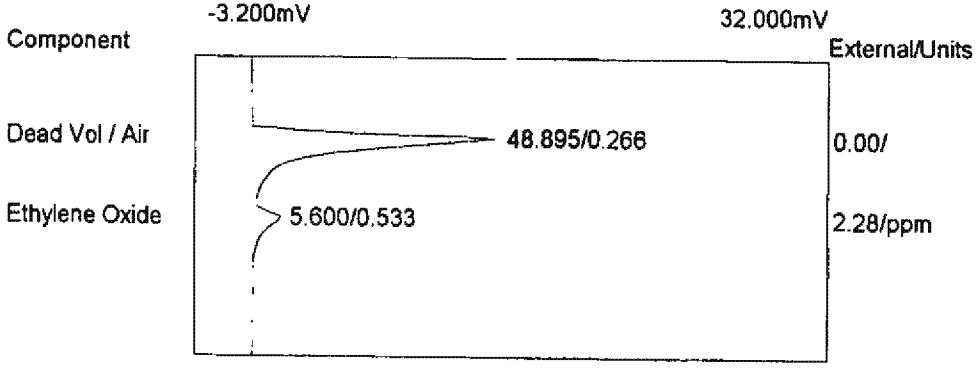
Component	Retention	Area	External	Units
Dead Vol / Air	0.283	49.636	0.00	
Ethylene Oxide	0.550	5.172	2.11	ppm
		54.808	2.11	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 12:53:22
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-A03.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



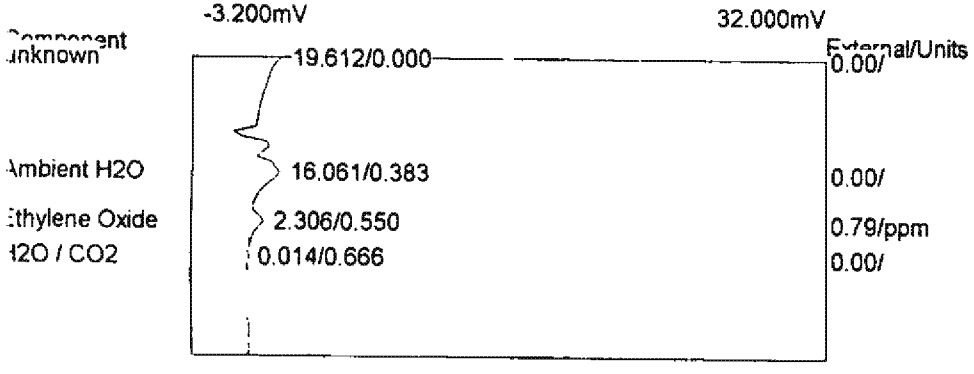
Component	Retention	Area	External	Units
mbient H2O	0.383	14.726	0.00	
thylene Oxide	0.533	2.289	0.78	ppm
2O / CO2	0.666	0.024	0.00	
		17.039	0.78	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 12:53:22
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT2-A03.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



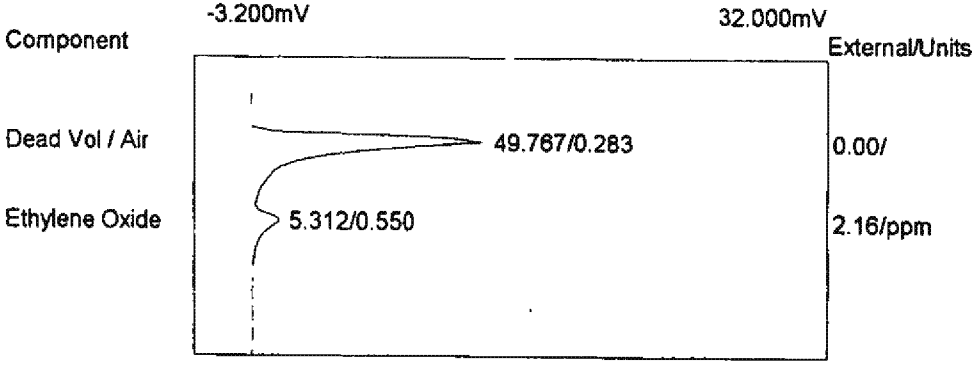
Component	Retention	Area	External	Units
Dead Vol / Air	0.266	48.895	0.00	
Ethylene Oxide	0.533	5.600	2.28	ppm
		54.495	2.28	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 12:58:22
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-A04.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



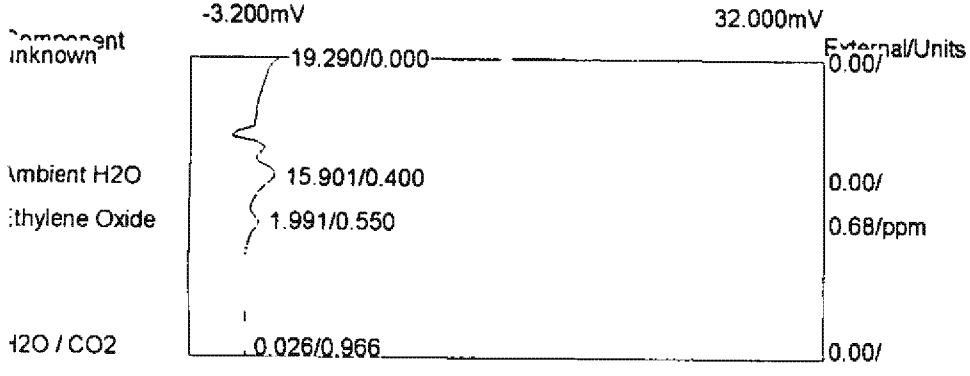
Component	Retention	Area	External	Units
Ambient H2O	0.383	16.061	0.00	
Ethylene Oxide	0.550	2.306	0.79	ppm
H2O / CO2	0.666	0.014	0.00	
		18.381	0.79	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 12:58:22
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT2-A04.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



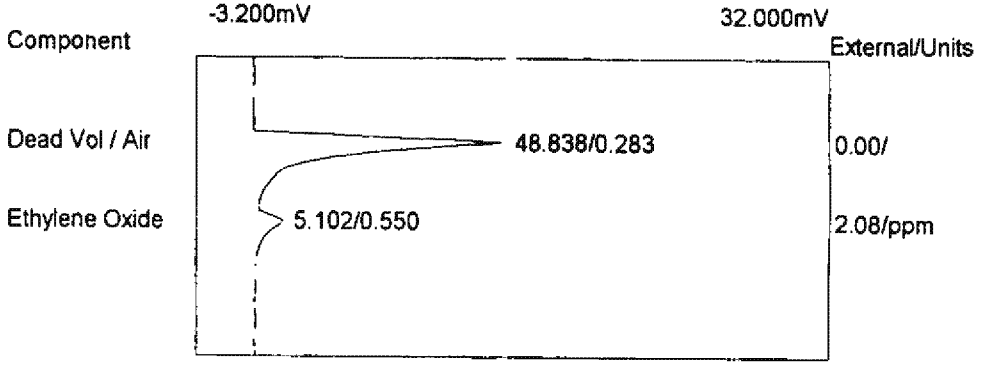
Component	Retention	Area	External	Units
Dead Vol / Air	0.283	49.767	0.00	
Ethylene Oxide	0.550	5.312	2.16	ppm
		55.079	2.16	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 13:03:22
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-A05.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.400	15.901	0.00	
Ethylene Oxide	0.550	1.991	0.68	ppm
H2O / CO2	0.966	0.026	0.00	
		17.918	0.68	

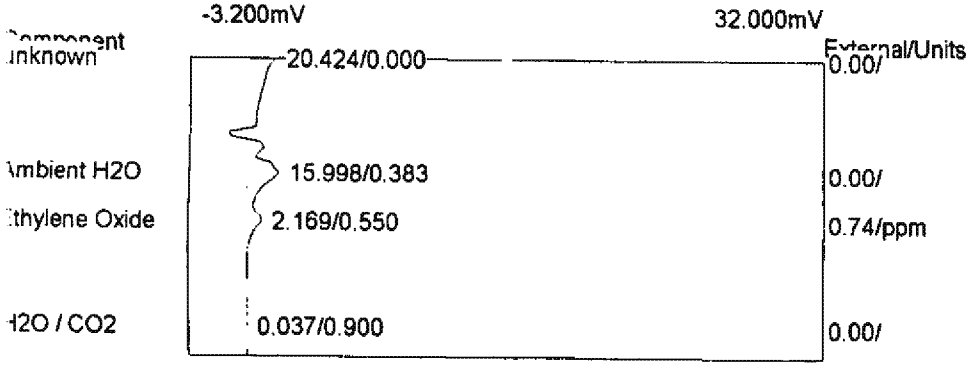
Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 13:03:22
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT2-A05.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	48.838	0.00	
Ethylene Oxide	0.550	5.102	2.08	ppm
		53.940	2.08	

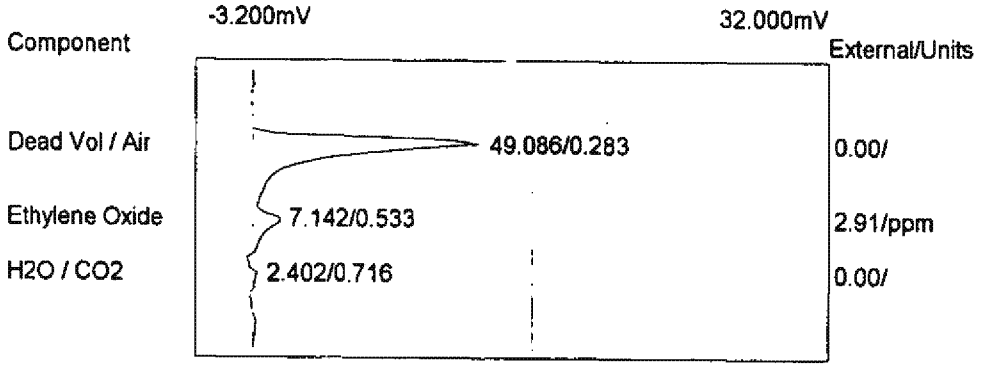
ED_002192_00004534-00150

Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 13:08:20
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-A06.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	15.998	0.00	
Ethylene Oxide	0.550	2.169	0.74	ppm
H2O / CO2	0.900	0.037	0.00	
		18.204	0.74	

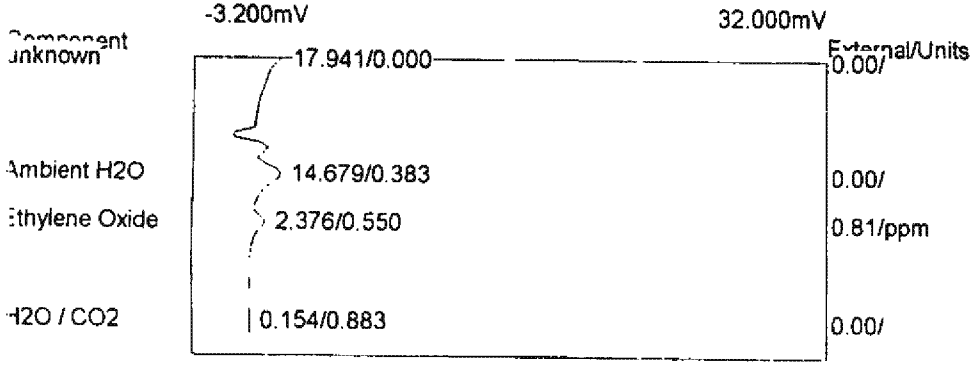
Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 13:08:20
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT2-A06.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	49.086	0.00	
Ethylene Oxide	0.533	7.142	2.91	ppm
H2O / CO2	0.716	2.402	0.00	
		58.630	2.91	

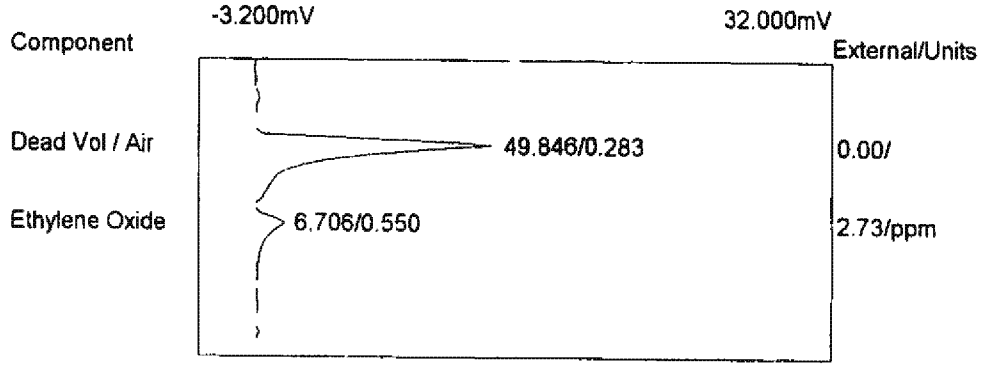
ED_002192_00004534-00151

Client: IBAGrifith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 13:13:23
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-A07.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	14.679	0.00	
Ethylene Oxide	0.550	2.376	0.81	ppm
H2O / CO2	0.883	0.154	0.00	
		17.209	0.81	

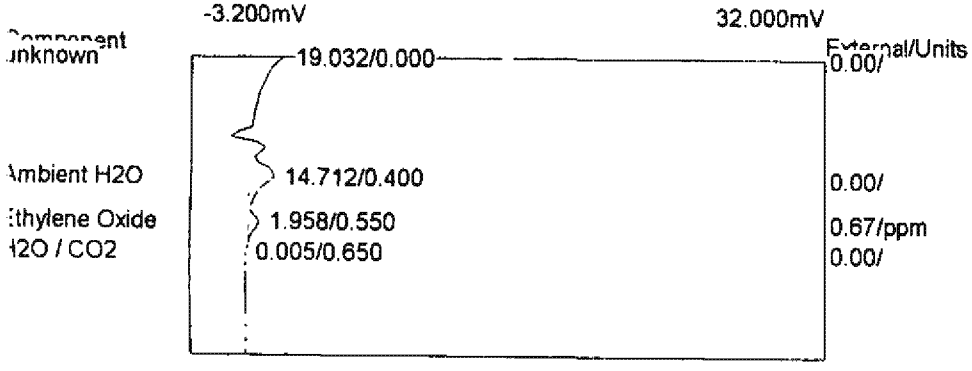
Client: IBAGrifith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 13:13:23
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT2-A07.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	49.846	0.00	
Ethylene Oxide	0.550	6.706	2.73	ppm
		56.552	2.73	

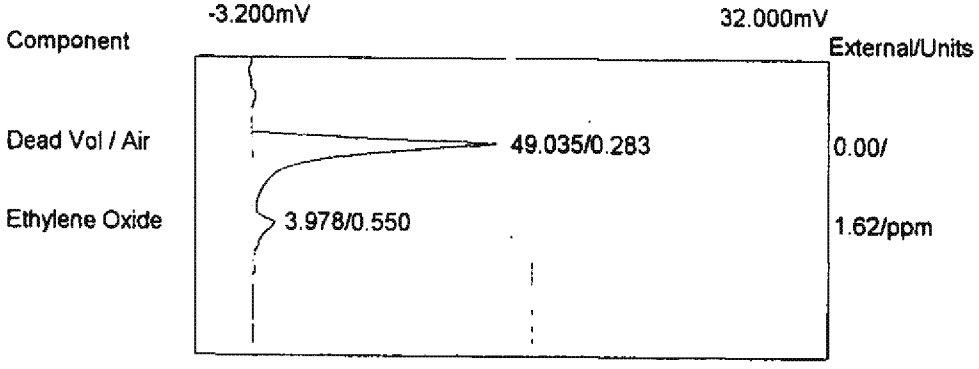
ED_002192_00004534-00152

Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 13:18:32
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-A08.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.400	14.712	0.00	
Ethylene Oxide	0.550	1.958	0.67	ppm
H2O / CO2	0.650	0.005	0.00	
		16.675	0.67	

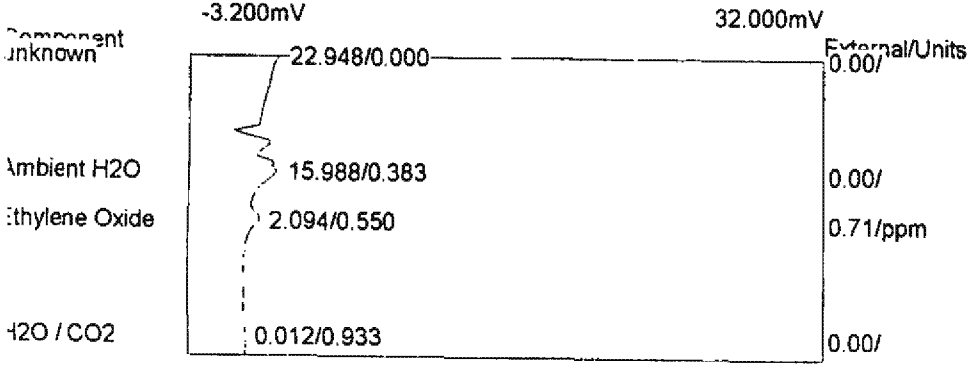
Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 13:18:32
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT2-A08.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	49.035	0.00	
Ethylene Oxide	0.550	3.978	1.62	ppm
		53.013	1.62	

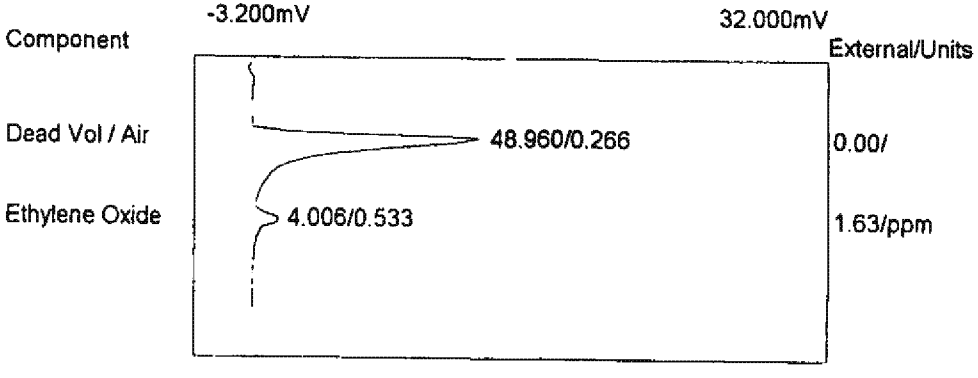
ED_002192_00004534-00153

Client ID: Run#1Aer
Analysis date: 01/24/2003 13:23:23
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-A09.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	15.988	0.00	
Ethylene Oxide	0.550	2.094	0.71	ppm
H2O / CO2	0.933	0.012	0.00	
		18.094	0.71	

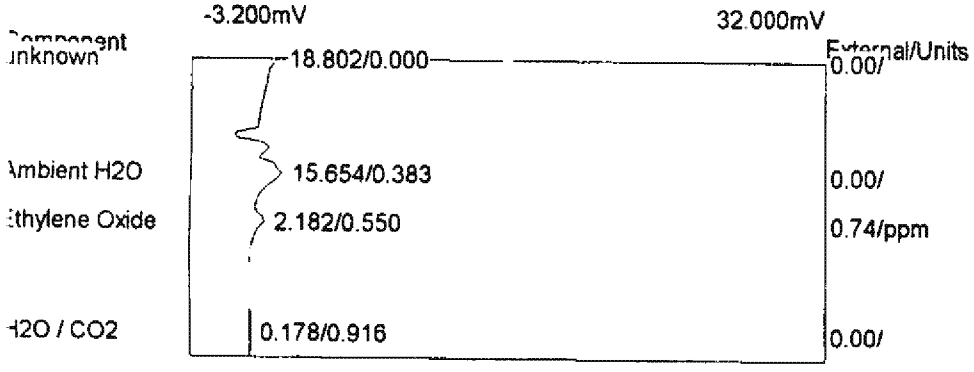
Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 13:23:23
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT2-A09.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	48.960	0.00	
Ethylene Oxide	0.533	4.006	1.63	ppm
		52.966	1.63	

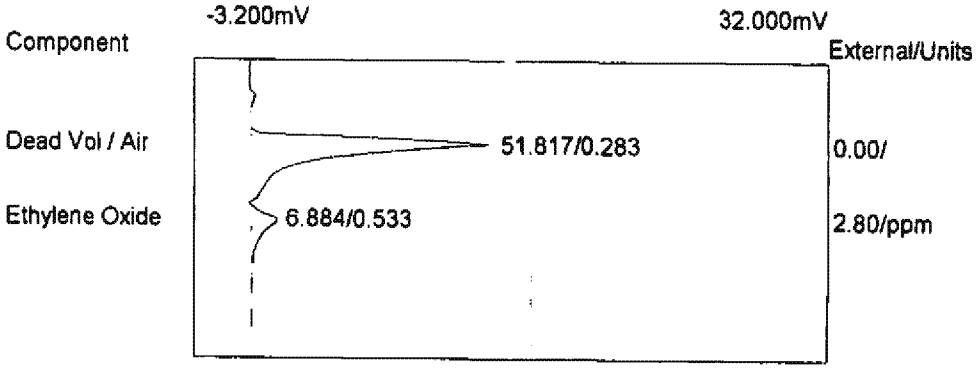
ED_002192_00004534-00154

Client ID: Run#2Aer
Analysis date: 01/24/2003 13:28:20
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-A10.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



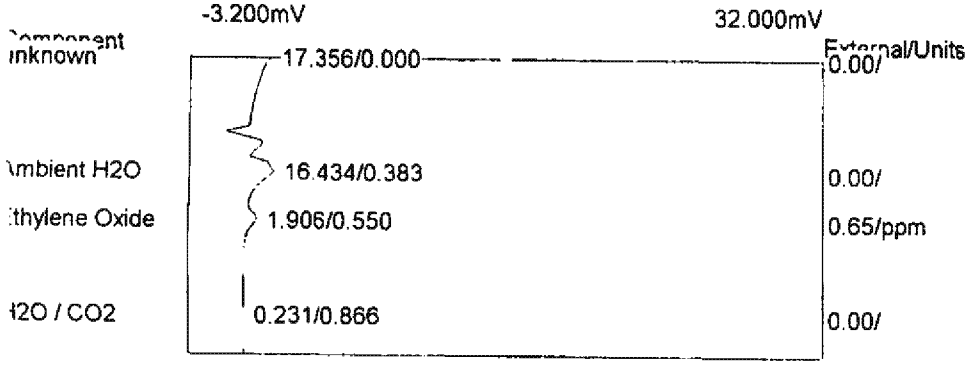
Component	Retention	Area	External	Units
Ambient H2O	0.383	15.654	0.00	
Ethylene Oxide	0.550	2.182	0.74	ppm
H2O / CO2	0.916	0.178	0.00	
		18.014	0.74	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 13:28:20
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT2-A10.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



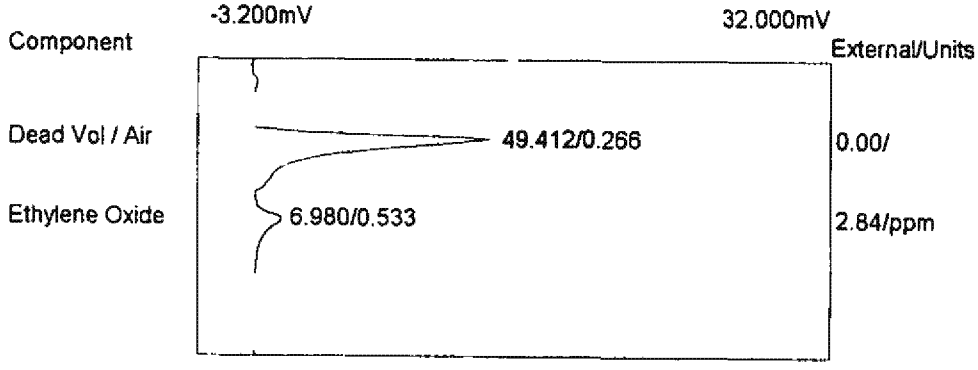
Component	Retention	Area	External	Units
Dead Vol / Air	0.283	51.817	0.00	
Ethylene Oxide	0.533	6.884	2.80	ppm
		58.701	2.80	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 13:33:21
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-A11.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	16.434	0.00	
Ethylene Oxide	0.550	1.906	0.65	ppm
H2O / CO2	0.866	0.231	0.00	
		18.571	0.65	

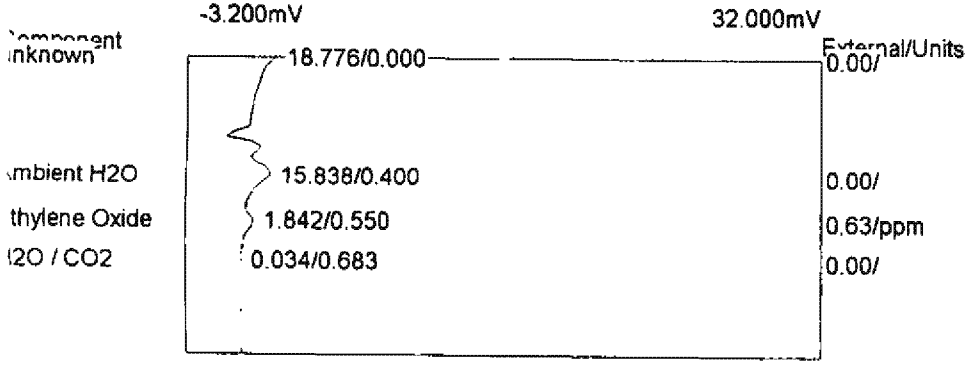
Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 13:33:21
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT2-A11.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	49.412	0.00	
Ethylene Oxide	0.533	6.980	2.84	ppm
		56.392	2.84	

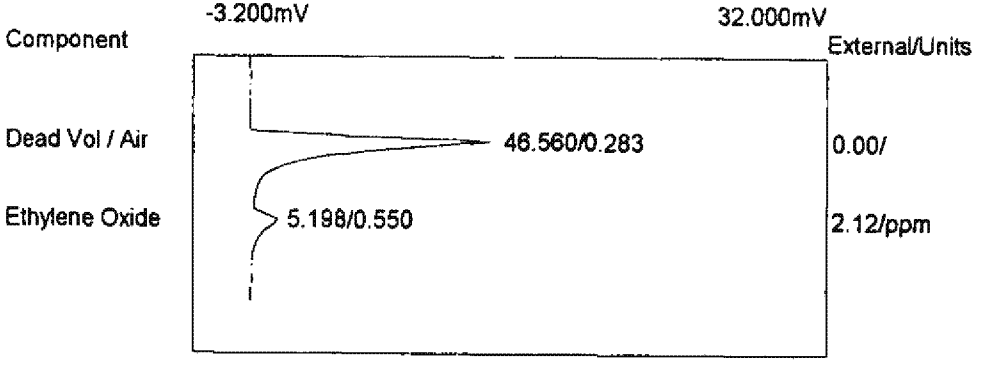
ED_002192_00004534-00156

Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 13:38:22
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT2-A12.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
mbient H2O	0.400	15.838	0.00	
thylene Oxide	0.550	1.842	0.63	ppm
2O / CO2	0.683	0.034	0.00	
		17.714	0.63	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#2Aer
Analysis date: 01/24/2003 13:38:22
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT2-A12.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



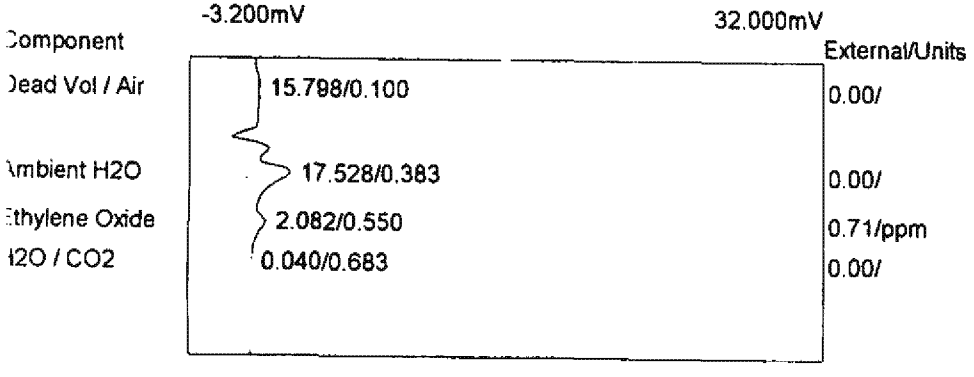
Component	Retention	Area	External	Units
Dead Vol / Air	0.283	46.560	0.00	
Ethylene Oxide	0.550	5.198	2.12	ppm
		51.758	2.12	

ED_002192_00004534-00157

APPENDIX J

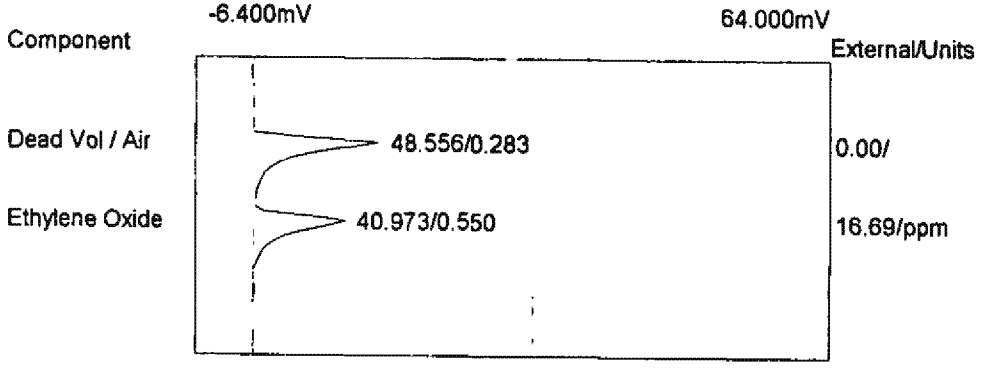
Plant 2 - Run #3 - Aeration Chromatograms - SC1 & SC2

Client ID: Run#3Aer
Analysis date: 01/24/2003 13:58:23
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT3-A01.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	15.798	0.00	
Ambient H2O	0.383	17.528	0.00	
Ethylene Oxide	0.550	2.082	0.71	ppm
H2O / CO2	0.683	0.040	0.00	
		35.448	0.71	

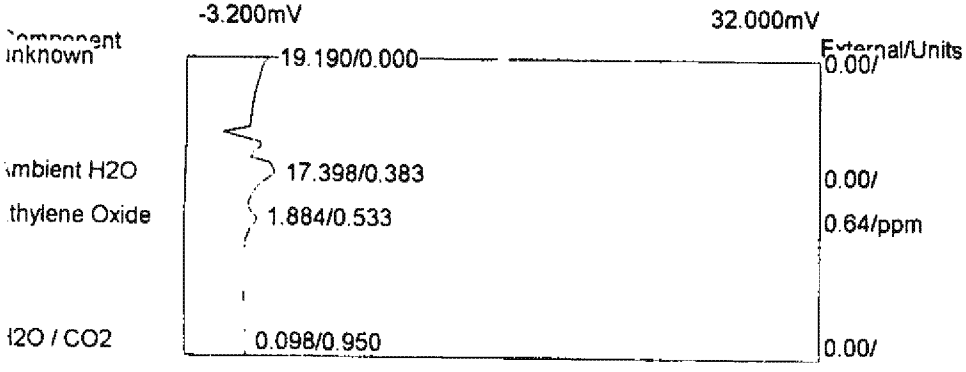
Client ID: IBAGrimm-Willowbrook 2
Client ID: Run#3Aer
Analysis date: 01/24/2003 13:58:23
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT3-A01.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	48.556	0.00	
Ethylene Oxide	0.550	40.973	16.69	ppm
		89.529	16.69	

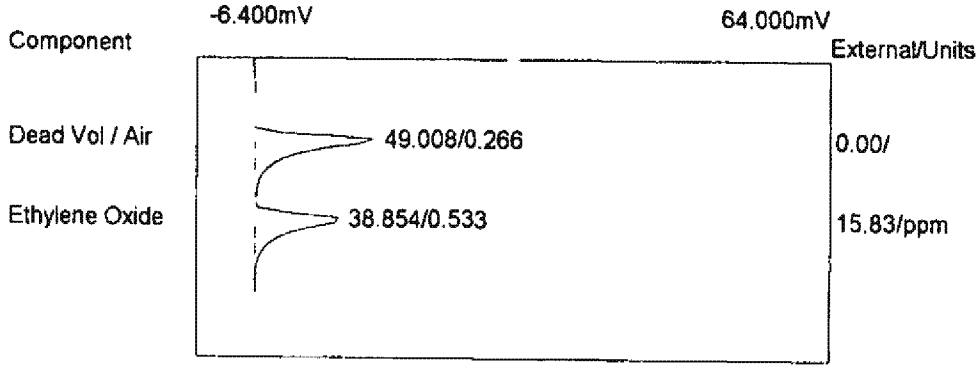
ED_002192_00004534-00159

Client: IBAGriffith-Willowbrook 2
Client ID: Run#3Aer
Analysis date: 01/24/2003 14:03:20
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT3-A02.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	17.398	0.00	
Ethylene Oxide	0.533	1.884	0.64	ppm
H2O / CO2	0.950	0.098	0.00	
		19.380	0.64	

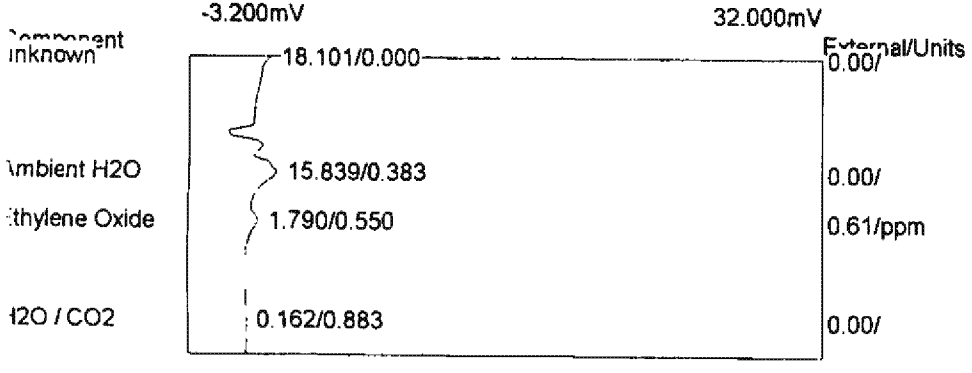
Client: IBAGriffith-Willowbrook 2
Client ID: Run#3Aer
Analysis date: 01/24/2003 14:03:20
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT3-A02.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	49.008	0.00	
Ethylene Oxide	0.533	38.854	15.83	ppm
		87.862	15.83	

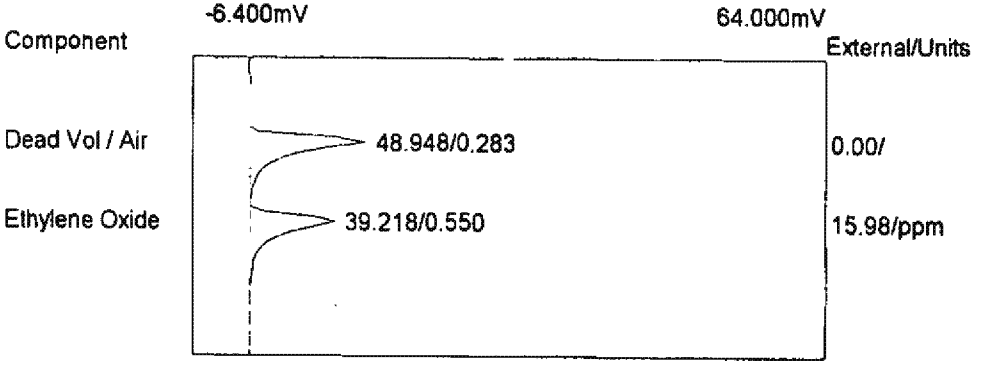
ED_002192_00004534-00160

Client ID: Run#3Aer
Analysis date: 01/24/2003 14:08:22
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT3-A03.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	15.839	0.00	
Ethylene Oxide	0.550	1.790	0.61	ppm
H2O / CO2	0.883	0.162	0.00	
		17.791	0.61	

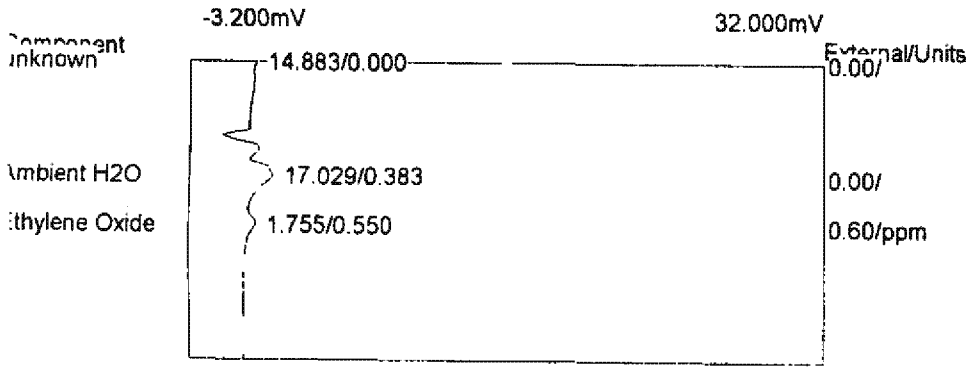
Client ID: Run#3Aer
Analysis date: 01/24/2003 14:08:22
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT3-A03.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	48.948	0.00	
Ethylene Oxide	0.550	39.218	15.98	ppm
		88.166	15.98	

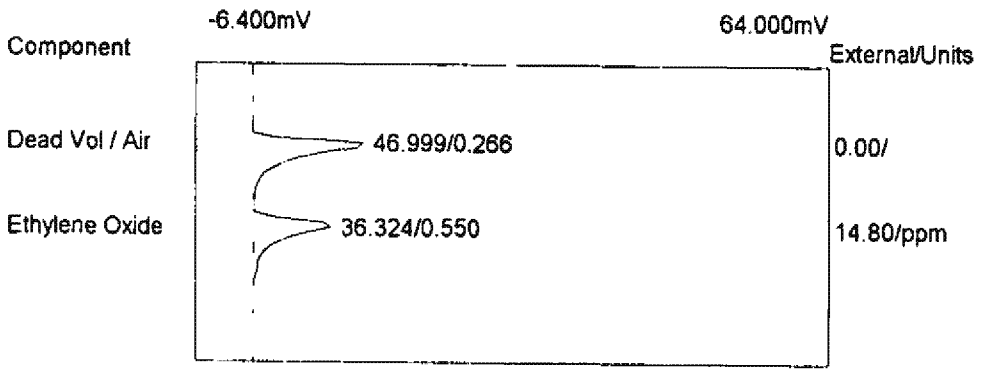
ED_002192_00004534-00161

Client: IBAGriffith-Willowbrook 2
Client ID: Run#3Aer
Analysis date: 01/24/2003 14:13:25
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT3-A04.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	17.029	0.00	
Ethylene Oxide	0.550	1.755	0.60	ppm
		18.784	0.60	

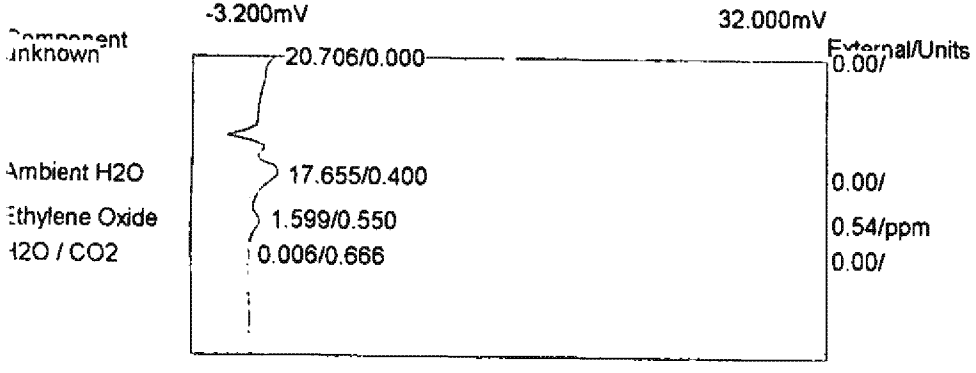
Client: IBAGriffith-Willowbrook 2
Client ID: Run#3Aer
Analysis date: 01/24/2003 14:13:25
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT3-A04.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	46.999	0.00	
Ethylene Oxide	0.550	36.324	14.80	ppm
		83.323	14.80	

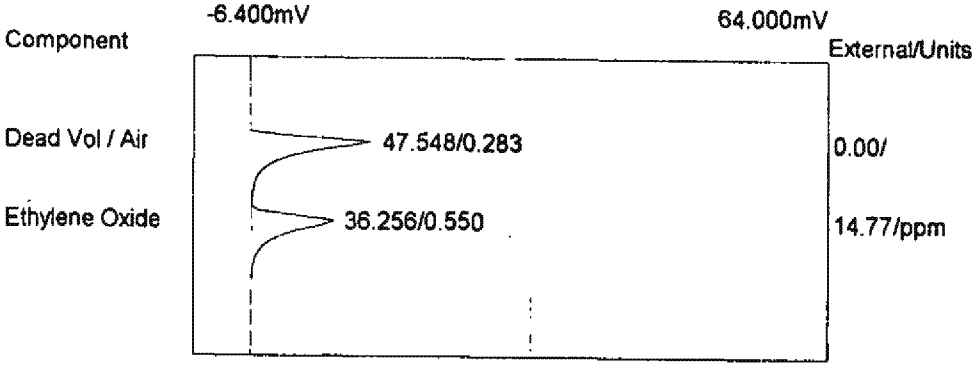
ED_002192_00004534-00162

Client ID: Run#3Aer
Analysis date: 01/24/2003 14:18:22
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT3-A05.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.400	17.655	0.00	
Ethylene Oxide	0.550	1.599	0.54	ppm
H2O / CO2	0.666	0.006	0.00	
		19.260	0.54	

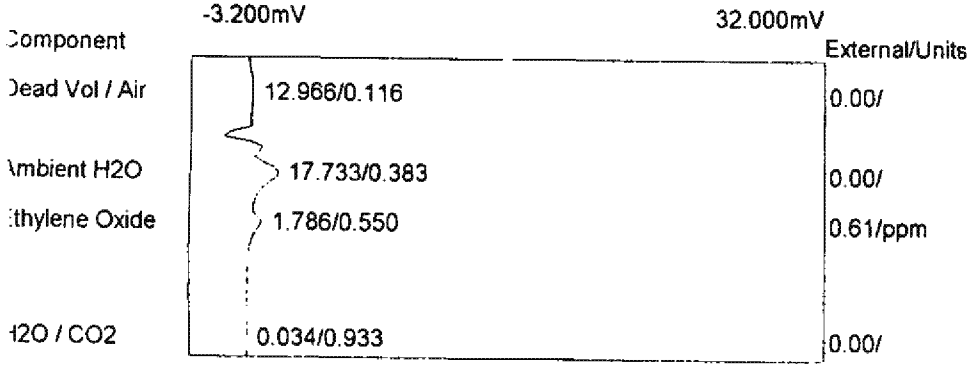
Client: IBAGriffith-Willowbrook 2
Client ID: Run#3Aer
Analysis date: 01/24/2003 14:18:22
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT3-A05.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	47.548	0.00	
Ethylene Oxide	0.550	36.256	14.77	ppm
		83.804	14.77	

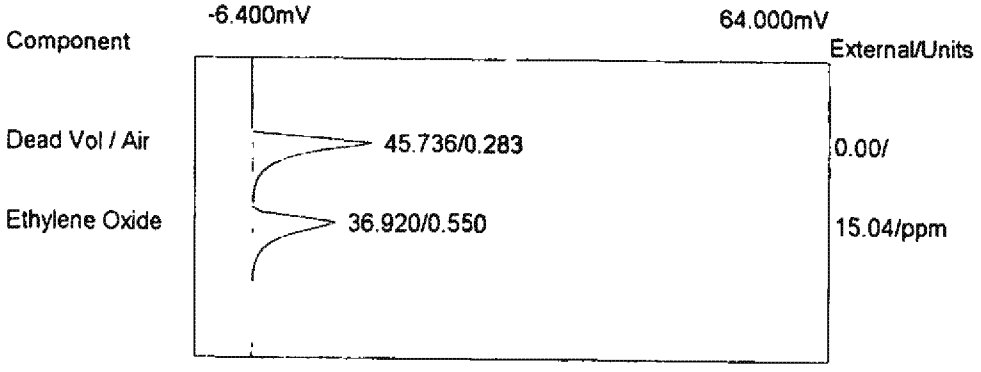
ED_002192_00004534-00163

Client: IBAGriffith-Willowbrook 2
Client ID: Run#3Aer
Analysis date: 01/24/2003 14:23:42
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT3-A06.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.116	12.966	0.00	
Ambient H2O	0.383	17.733	0.00	
Ethylene Oxide	0.550	1.786	0.61	ppm
H2O / CO2	0.933	0.034	0.00	
		32.519	0.61	

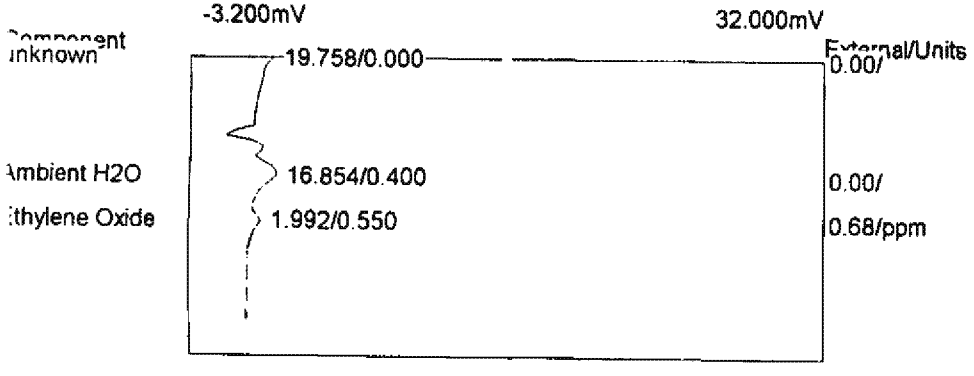
Client: IBAGriffith-Willowbrook 2
Client ID: Run#3Aer
Analysis date: 01/24/2003 14:23:42
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT3-A06.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	45.736	0.00	
Ethylene Oxide	0.550	36.920	15.04	ppm
		82.656	15.04	

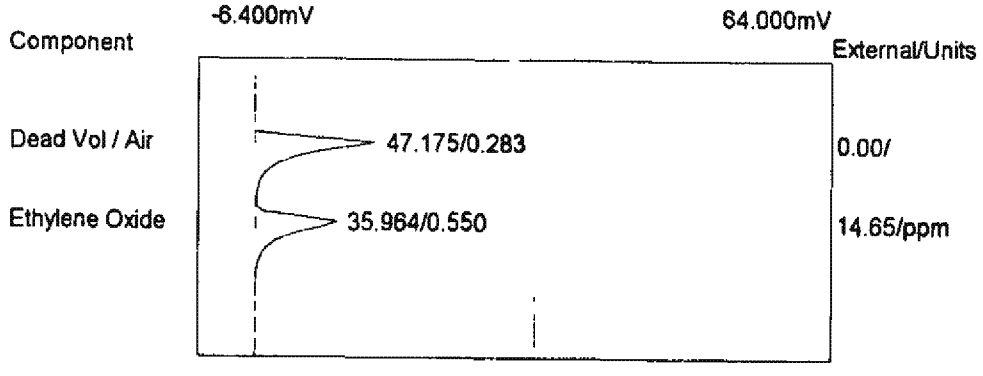
ED_002192_00004534-00164

Client: IBAGriffith-Willowbrook 2
Client ID: Run#3Aer
Analysis date: 01/24/2003 14:28:22
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT3-A07.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.400	16.854	0.00	
Ethylene Oxide	0.550	1.992	0.68	ppm
		18.846	0.68	

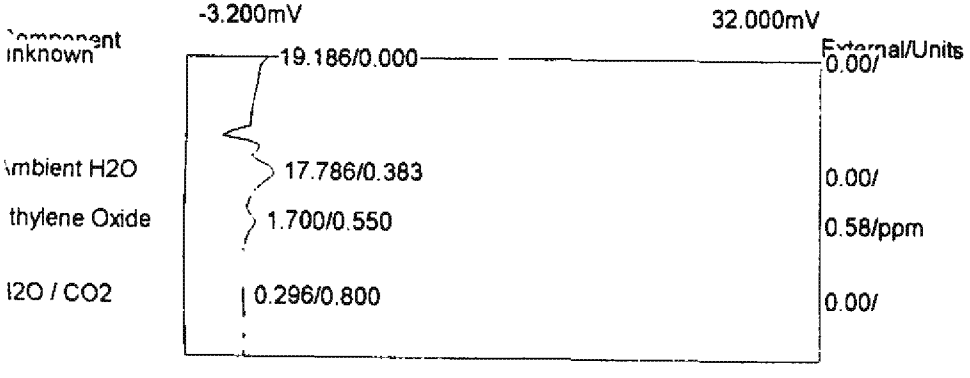
Client: IBAGriffith-Willowbrook 2
Client ID: Run#3Aer
Analysis date: 01/24/2003 14:28:22
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT3-A07.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	47.175	0.00	
Ethylene Oxide	0.550	35.964	14.65	ppm
		83.139	14.65	

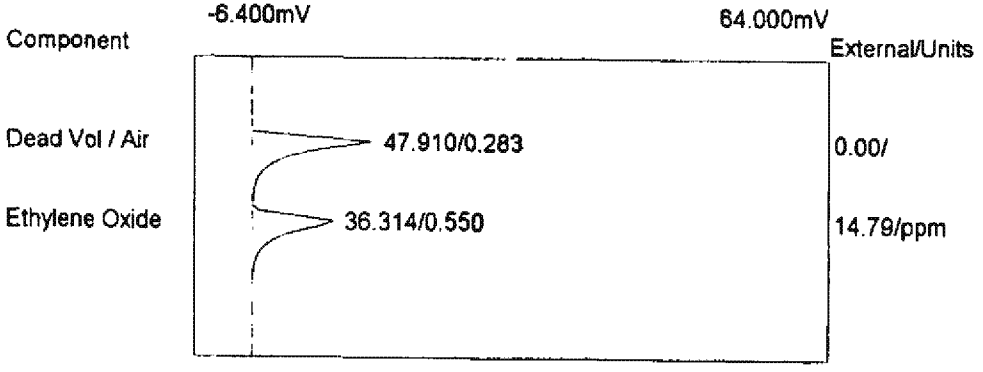
ED_002192_00004534-00165

Client ID: Run#3Aer
Analysis date: 01/24/2003 14:33:25
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT3-A08.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	17.786	0.00	
Ethylene Oxide	0.550	1.700	0.58	ppm
H2O / CO2	0.800	0.296	0.00	
		19.782	0.58	

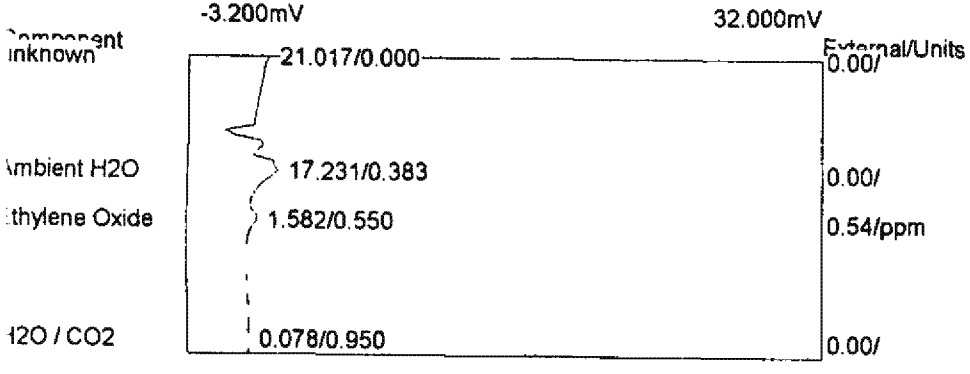
Client: IBA Griffith-Willowbrook 2
Client ID: Run#3Aer
Analysis date: 01/24/2003 14:33:25
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT3-A08.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	47.910	0.00	
Ethylene Oxide	0.550	36.314	14.79	ppm
		84.224	14.79	

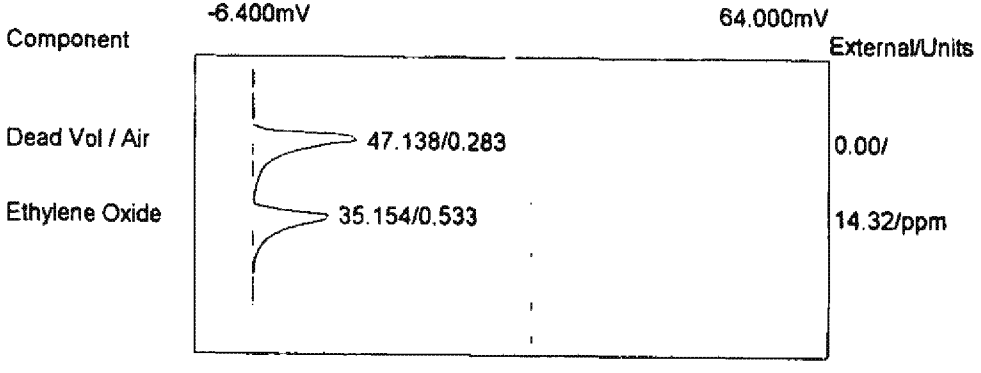
ED_002192_00004534-00166

Client ID: Run#3Aer
Analysis date: 01/24/2003 14:38:24
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT3-A09.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	17.231	0.00	
Ethylene Oxide	0.550	1.582	0.54	ppm
H2O / CO2	0.950	0.078	0.00	
		18.891	0.54	

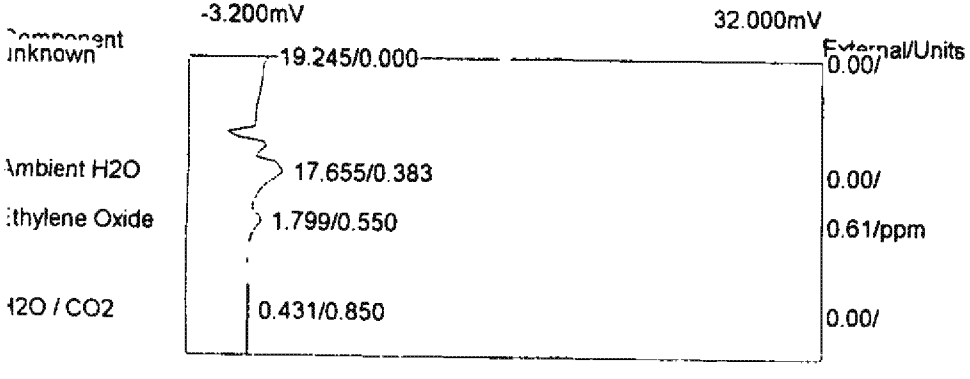
Client: IBAGriffith-Willowbrook 2
Client ID: Run#3Aer
Analysis date: 01/24/2003 14:38:24
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT3-A09.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	47.138	0.00	
Ethylene Oxide	0.533	35.154	14.32	ppm
		82.292	14.32	

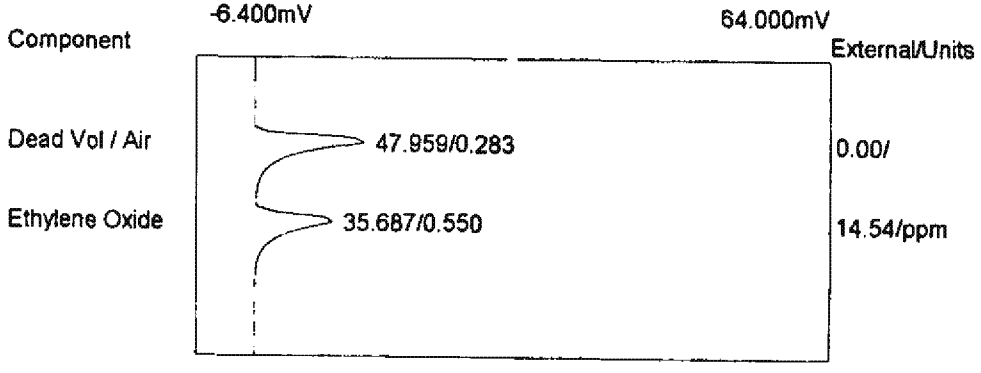
ED_002192_00004534-00167

Client ID: Run#3Aer
Analysis date: 01/24/2003 14:43:22
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT3-A10.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	17.655	0.00	
Ethylene Oxide	0.550	1.799	0.61	ppm
H2O / CO2	0.850	0.431	0.00	
		19.885	0.61	

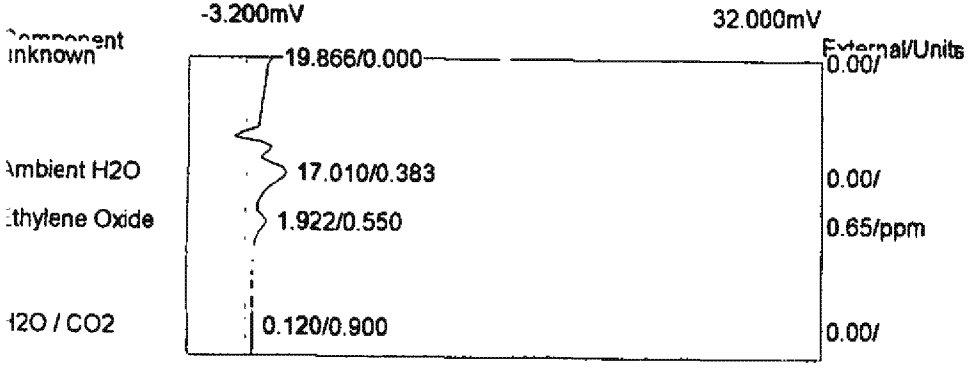
Client: IBAGriffith-Willowbrook 2
Client ID: Run#3Aer
Analysis date: 01/24/2003 14:43:22
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT3-A10.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	47.959	0.00	
Ethylene Oxide	0.550	35.687	14.54	ppm
		83.646	14.54	

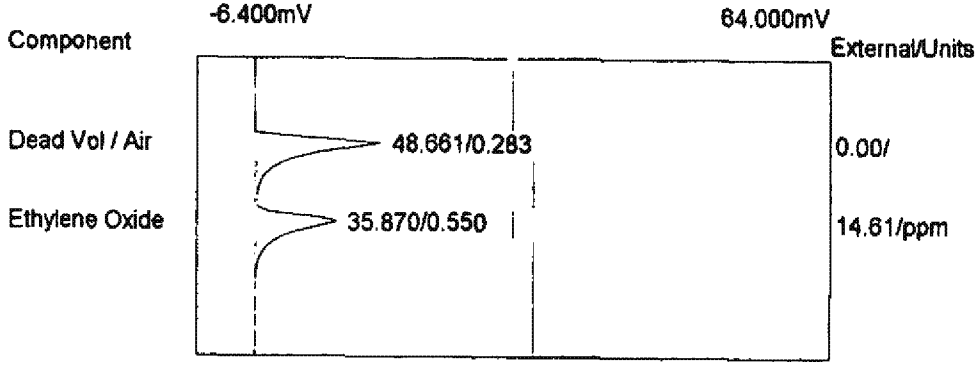
ED_002192_00004534-00168

Client: IBAGriffith-Willowbrook 2
Client ID: Run#3Aer
Analysis date: 01/24/2003 14:48:23
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT3-A11.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	17.010	0.00	
Ethylene Oxide	0.550	1.922	0.65	ppm
H2O / CO2	0.900	0.120	0.00	
		19.052	0.65	

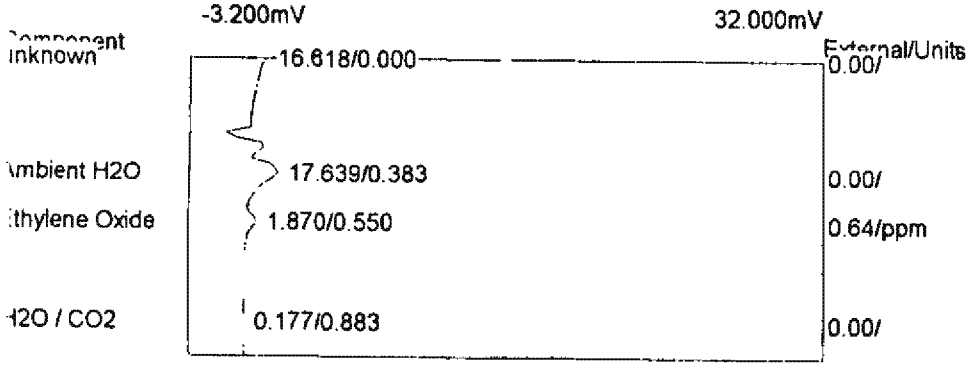
Client: IBAGriffith-Willowbrook 2
Client ID: Run#3Aer
Analysis date: 01/24/2003 14:48:23
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT3-A11.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	48.661	0.00	
Ethylene Oxide	0.550	35.870	14.61	ppm
		84.531	14.61	

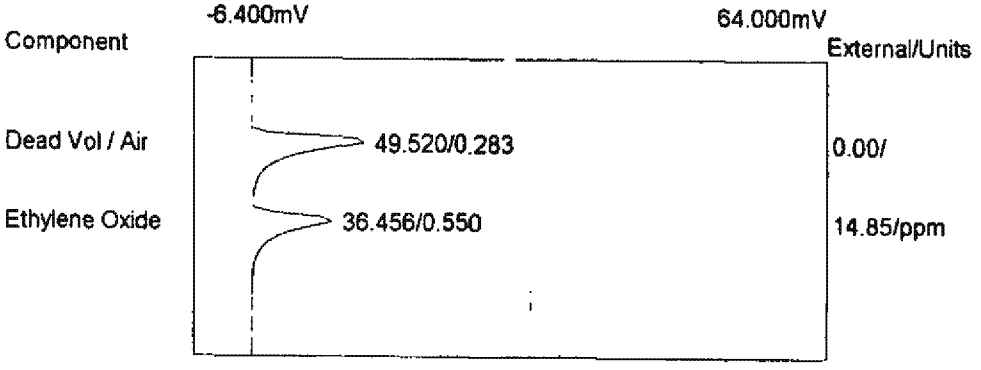
ED_002192_00004534-00169

Client: IBAGriffith-Willowbrook 2
Client ID: Run#3Aer
Analysis date: 01/24/2003 14:53:23
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT3-A12.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	17.639	0.00	
Ethylene Oxide	0.550	1.870	0.64	ppm
H2O / CO2	0.883	0.177	0.00	
		19.686	0.64	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#3Aer
Analysis date: 01/24/2003 14:53:23
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT3-A12.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



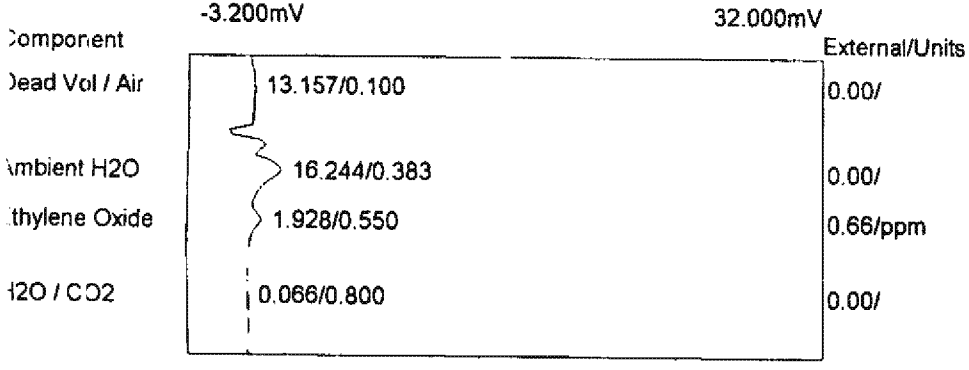
Component	Retention	Area	External	Units
Dead Vol / Air	0.283	49.520	0.00	
Ethylene Oxide	0.550	36.456	14.85	ppm
		85.976	14.85	

ED_002192_00004534-00170

APPENDIX K

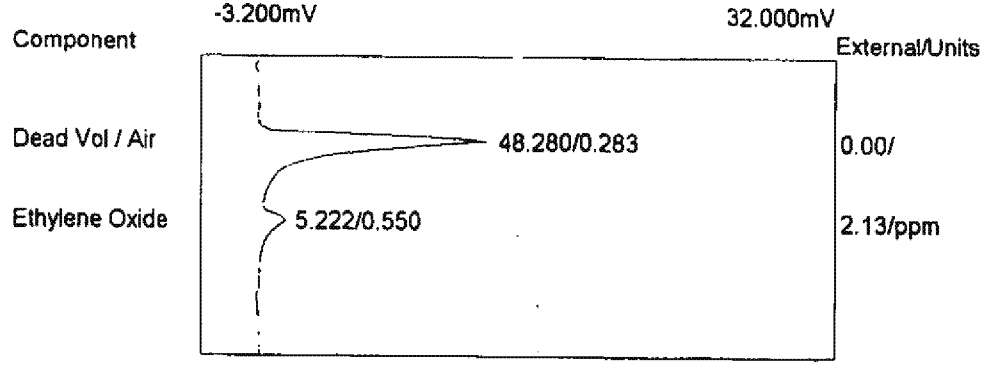
Plant 2 - Run #4 - Aeration Chromatograms - SC2 Only

Client: IBAGriffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:01:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT4-A01.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	13.157	0.00	
Ambient H2O	0.383	16.244	0.00	
Ethylene Oxide	0.550	1.928	0.66	ppm
H2O / CO2	0.800	0.066	0.00	
		31.395	0.66	

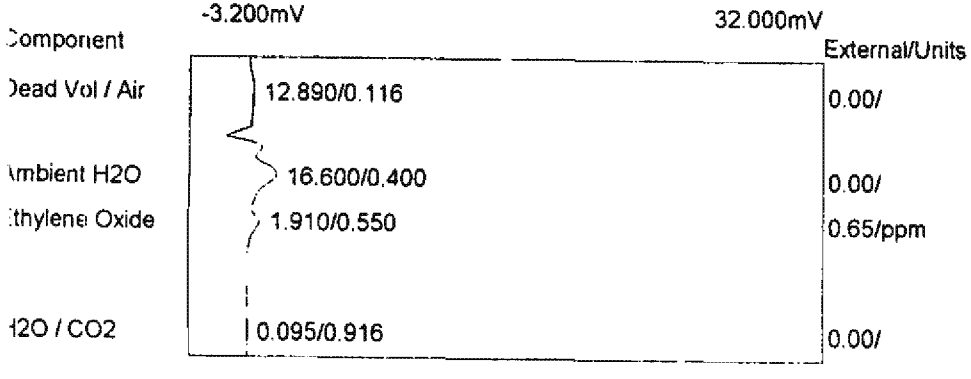
Client: IBAGriffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:01:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT4-A01.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	48.280	0.00	
Ethylene Oxide	0.550	5.222	2.13	ppm
		53.502	2.13	

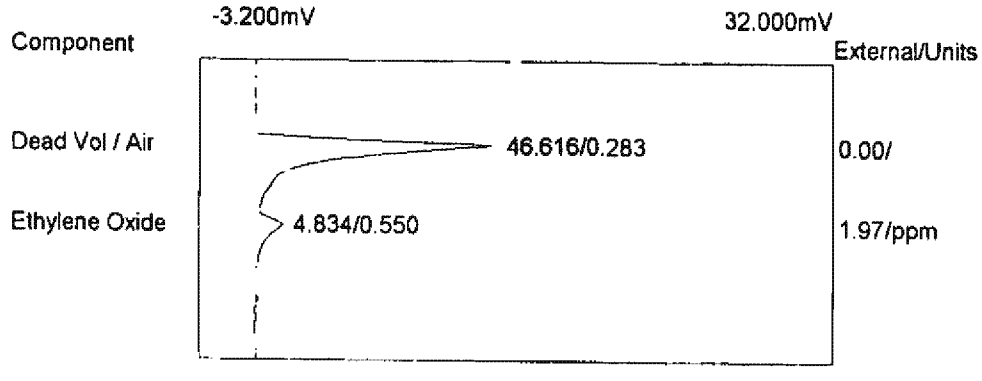
ED_002192_00004534-00172

Client ID: Run#4Aer
Analysis date: 01/24/2003 14:06:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT4-A02.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.116	12.890	0.00	
Ambient H2O	0.400	16.600	0.00	
Ethylene Oxide	0.550	1.910	0.65	ppm
H2O / CO2	0.916	0.095	0.00	
		31.495	0.65	

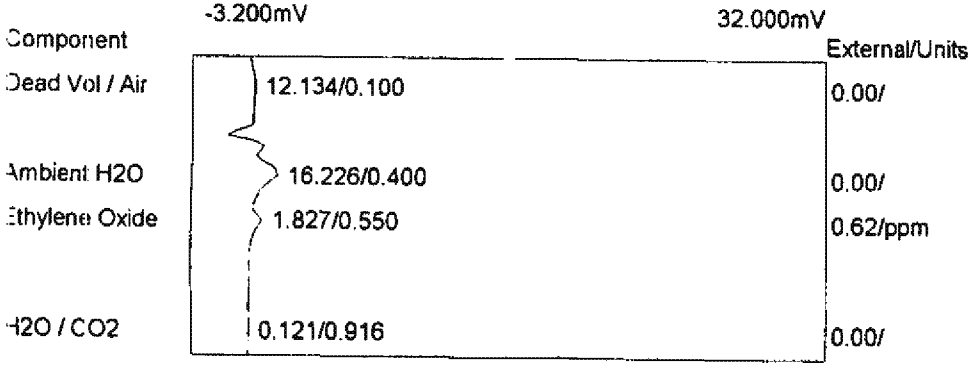
Client: IBAGriffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:06:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT4-A02.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	46.616	0.00	
Ethylene Oxide	0.550	4.834	1.97	ppm
		51.450	1.97	

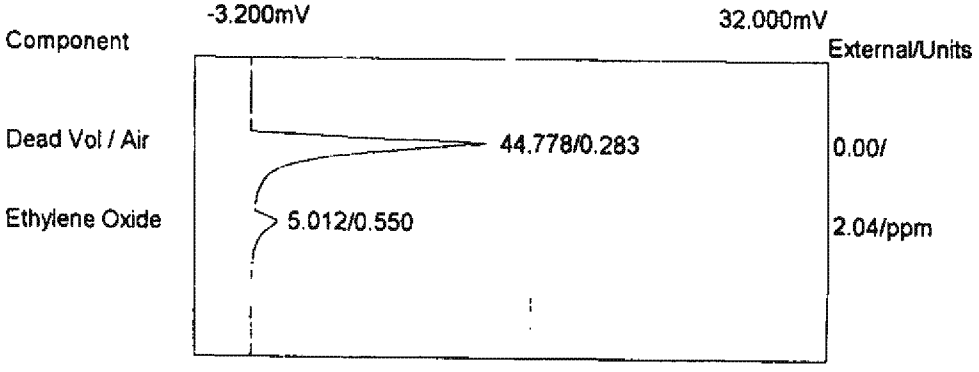
ED_002192_00004534-00173

Client ID: Run#4Aer
Analysis date: 01/24/2003 14:11:02
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT4-A03.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	12.134	0.00	
Ambient H2O	0.400	16.226	0.00	
Ethylene Oxide	0.550	1.827	0.62	ppm
H2O / CO2	0.916	0.121	0.00	
		30.308	0.62	

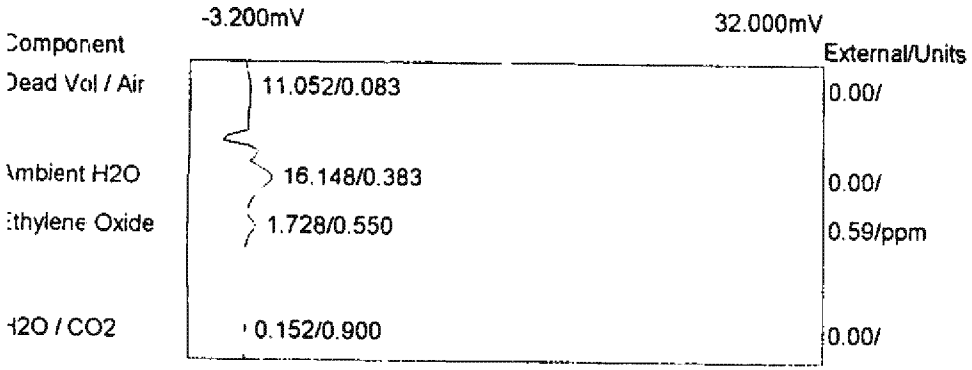
Client: IBA Griffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:11:02
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT4-A03.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	44.778	0.00	
Ethylene Oxide	0.550	5.012	2.04	ppm
		49.790	2.04	

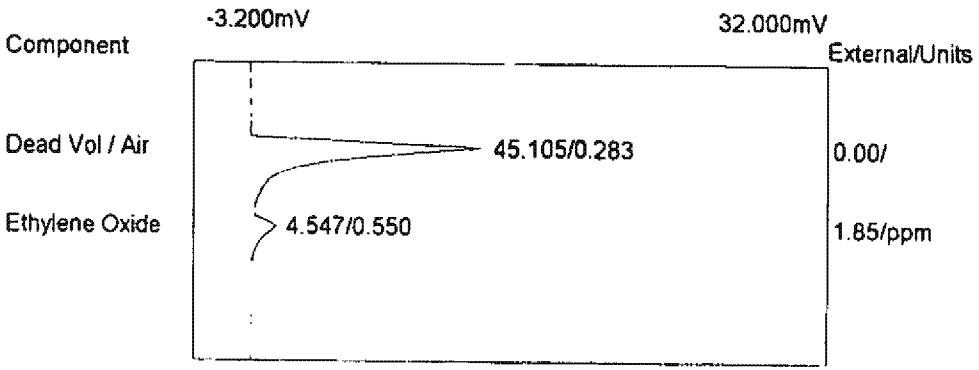
ED_002192_00004534-00174

Client: IBAGriffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:16:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT4-A04.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	11.052	0.00	
Ambient H2O	0.383	16.148	0.00	
Ethylene Oxide	0.550	1.728	0.59	ppm
H2O / CO2	0.900	0.152	0.00	
		29.080	0.59	

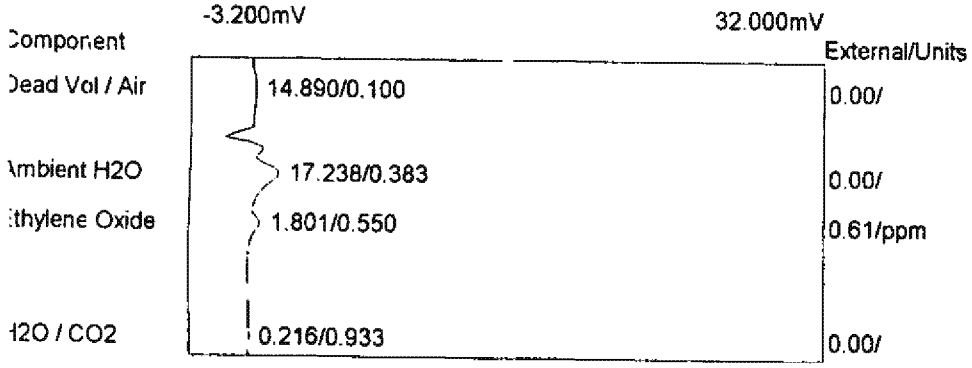
Client: IBAGriffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:16:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT4-A04.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	45.105	0.00	
Ethylene Oxide	0.550	4.547	1.85	ppm
		49.652	1.85	

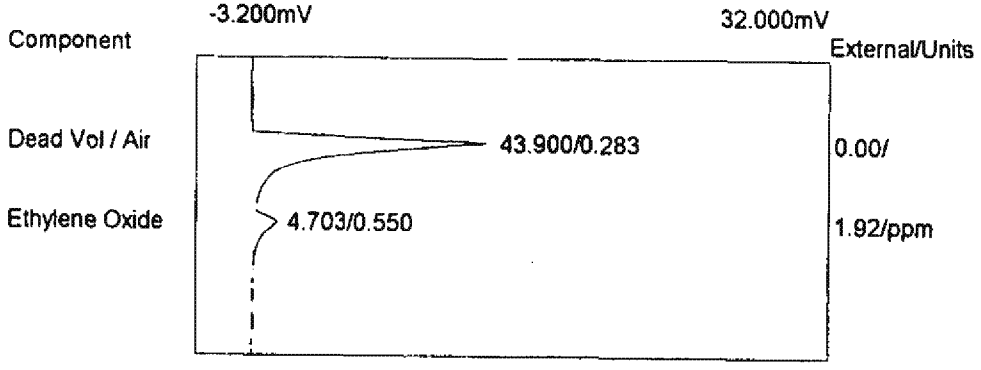
ED_002192_00004534-00175

Client: IBAGriffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:21:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT4-A05.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	14.890	0.00	
Ambient H2O	0.383	17.238	0.00	
Ethylene Oxide	0.550	1.801	0.61	ppm
H2O / CO2	0.933	0.216	0.00	
		34.145	0.61	

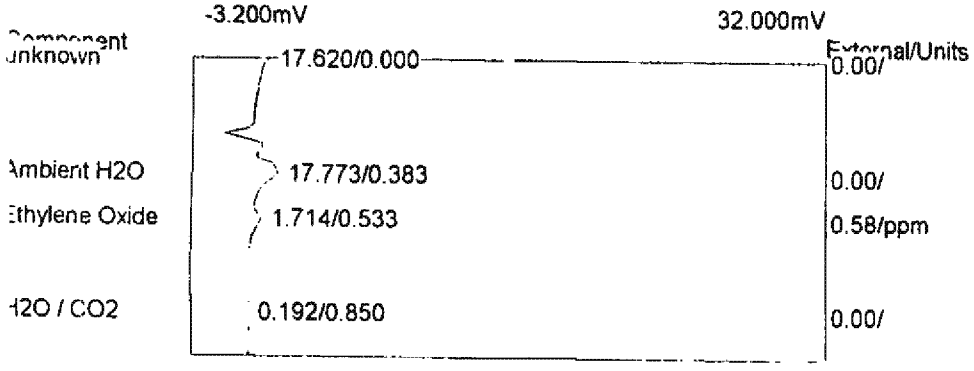
Client: IBAGriffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:21:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT4-A05.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	43.900	0.00	
Ethylene Oxide	0.550	4.703	1.92	ppm
		48.603	1.92	

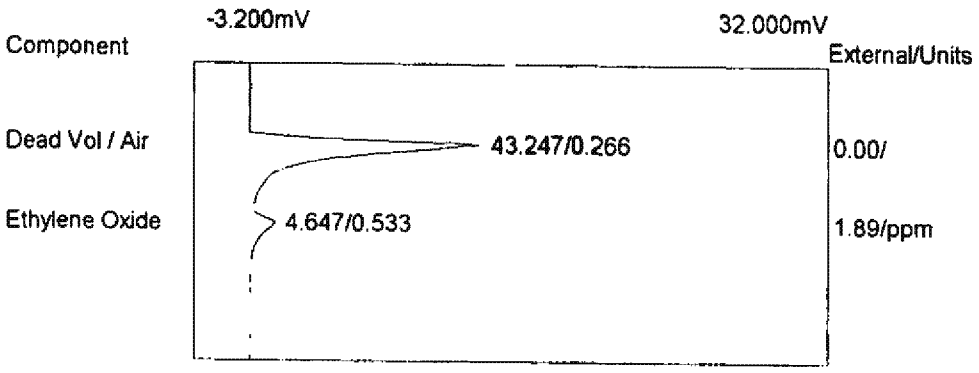
ED_002192_00004534-00176

Client: IBAGriffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:26:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT4-A06.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	17.773	0.00	
Ethylene Oxide	0.533	1.714	0.58	ppm
H2O / CO2	0.850	0.192	0.00	
		19.679	0.58	

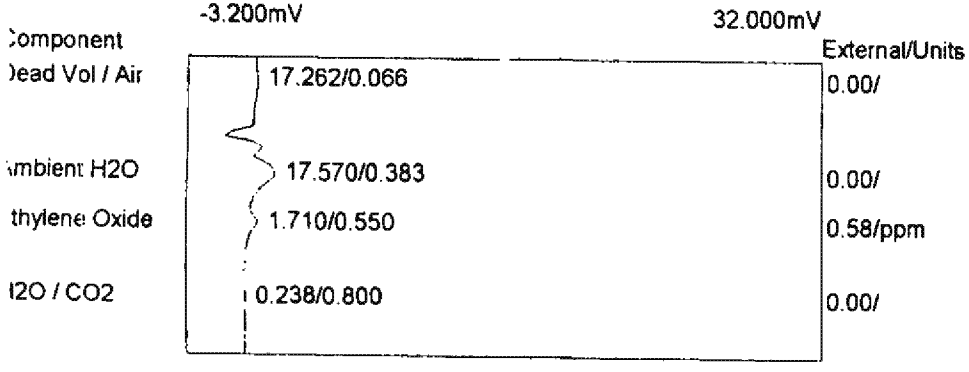
Client: IBAGriffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:26:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT4-A06.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	43.247	0.00	
Ethylene Oxide	0.533	4.647	1.89	ppm
		47.894	1.89	

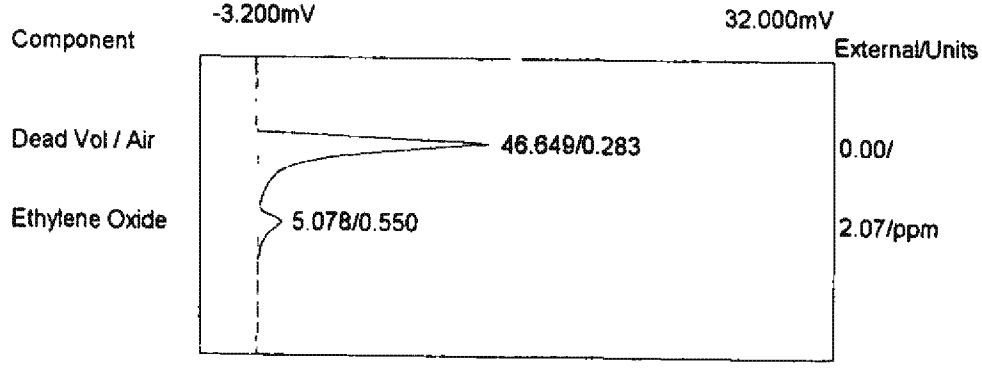
ED_002192_00004534-00177

Client: IBAGriffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:31:03
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT4-A07.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.066	17.262	0.00	
Ambient H2O	0.383	17.570	0.00	
Ethylene Oxide	0.550	1.710	0.58	ppm
H2O / CO2	0.800	0.238	0.00	
		36.780	0.58	

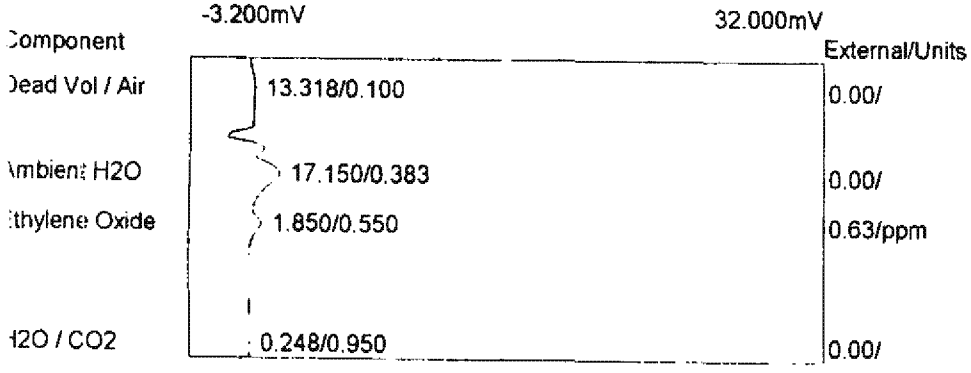
Client: IBAGriffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:31:03
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT4-A07.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	46.649	0.00	
Ethylene Oxide	0.550	5.078	2.07	ppm
		51.727	2.07	

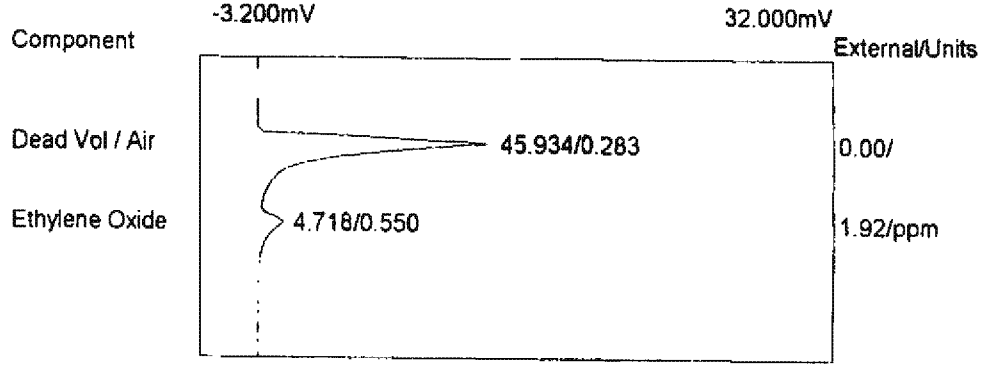
ED_002192_00004534-00178

Client: IBA Griffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:36:03
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT4-A08.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	13.318	0.00	
Ambient H2O	0.383	17.150	0.00	
Ethylene Oxide	0.550	1.850	0.63	ppm
H2O / CO2	0.950	0.248	0.00	
		32.566	0.63	

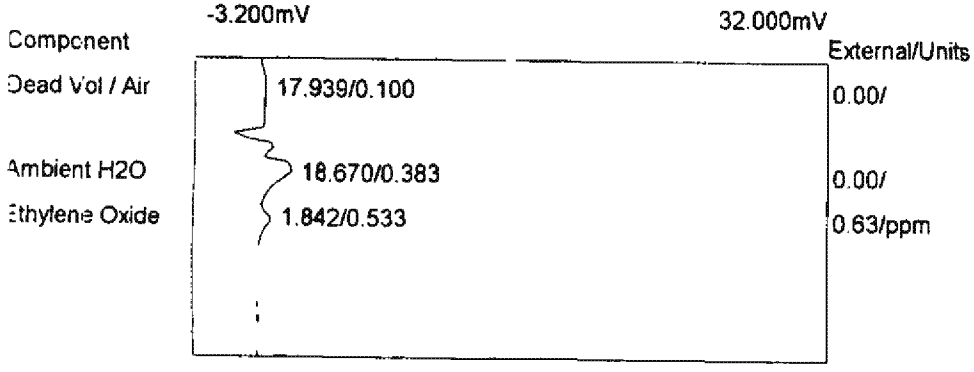
Client: IBA Griffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:36:03
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT4-A08.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	45.934	0.00	
Ethylene Oxide	0.550	4.718	1.92	ppm
		50.652	1.92	

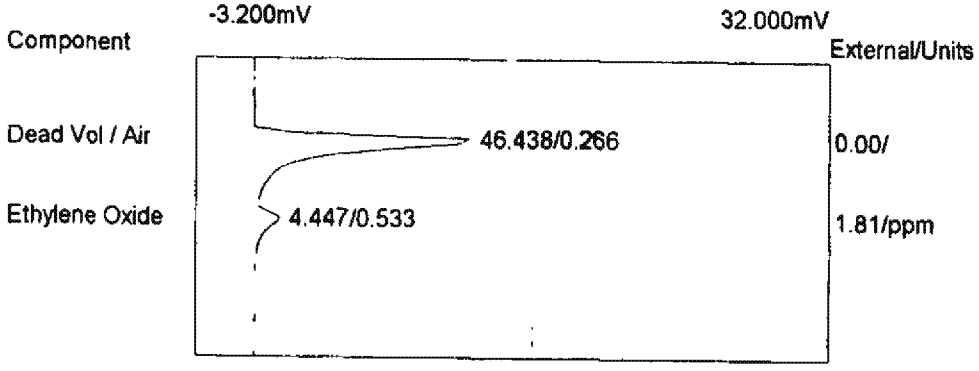
ED_002192_00004534-00179

Client: IBAGriffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:41:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT4-A09.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	17.939	0.00	
Ambient H2O	0.383	18.670	0.00	
Ethylene Oxide	0.533	1.842	0.63	ppm
		38.451	0.63	

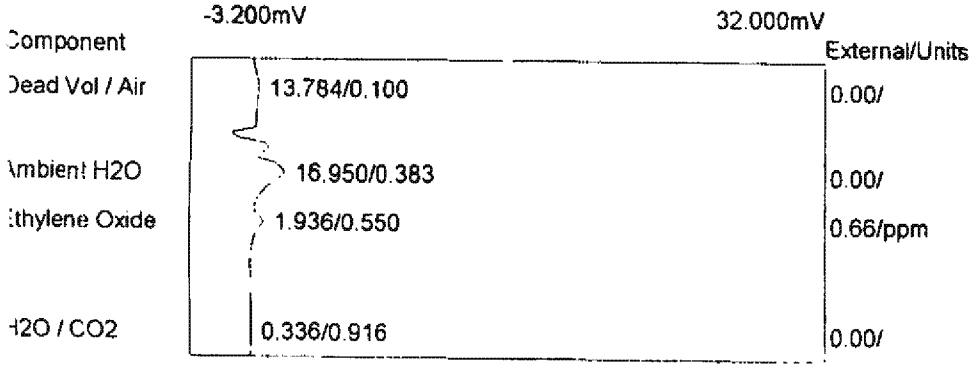
Client: IBAGriffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:41:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT4-A09.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	46.438	0.00	
Ethylene Oxide	0.533	4.447	1.81	ppm
		50.885	1.81	

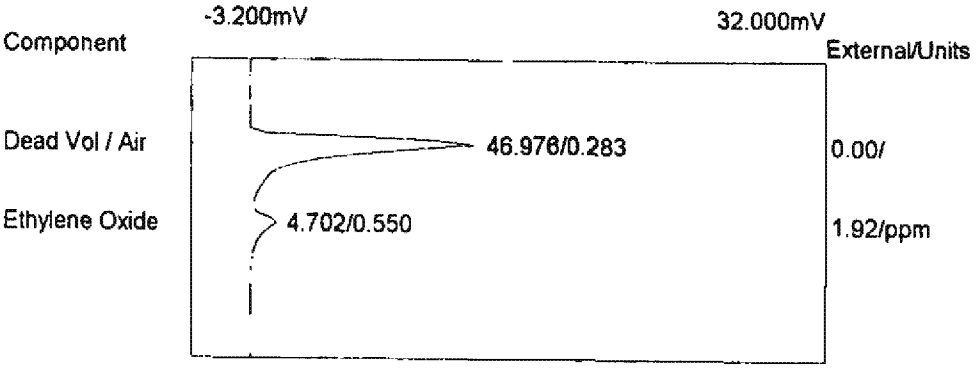
ED_002192_00004534-00180

Client: IBAGriffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:46:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT4-A10.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	13.784	0.00	
Ambient H2O	0.383	16.950	0.00	
Ethylene Oxide	0.550	1.936	0.66	ppm
H2O / CO2	0.916	0.336	0.00	
		33.006	0.66	

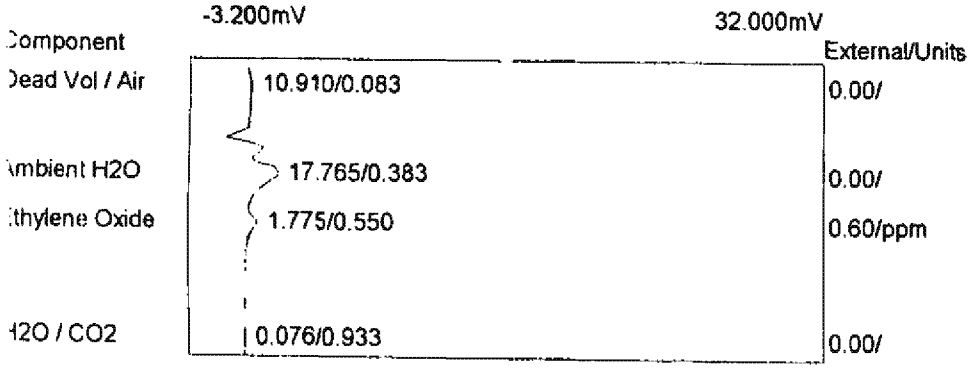
Client: IBAGriffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:46:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT4-A10.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	46.976	0.00	
Ethylene Oxide	0.550	4.702	1.92	ppm
		51.678	1.92	

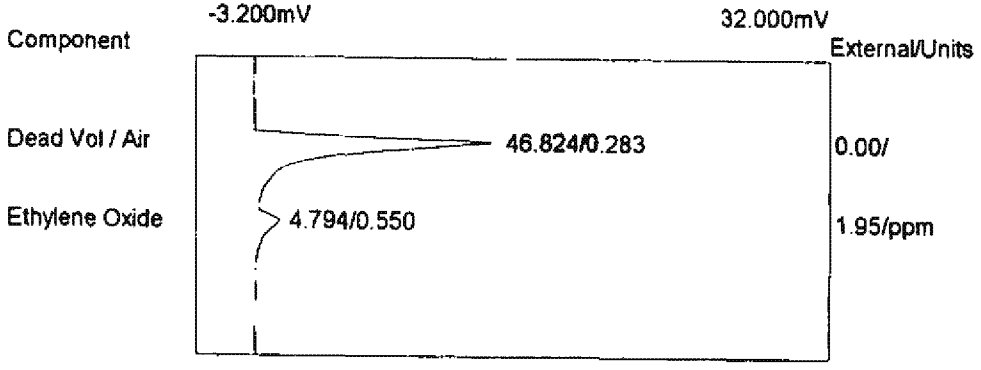
ED_002192_00004534-00181

Client: IBAGriffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:51:02
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT4-A11.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	10.910	0.00	
Ambient H2O	0.383	17.765	0.00	
Ethylene Oxide	0.550	1.775	0.60	ppm
H2O / CO2	0.933	0.076	0.00	
		30.526	0.60	

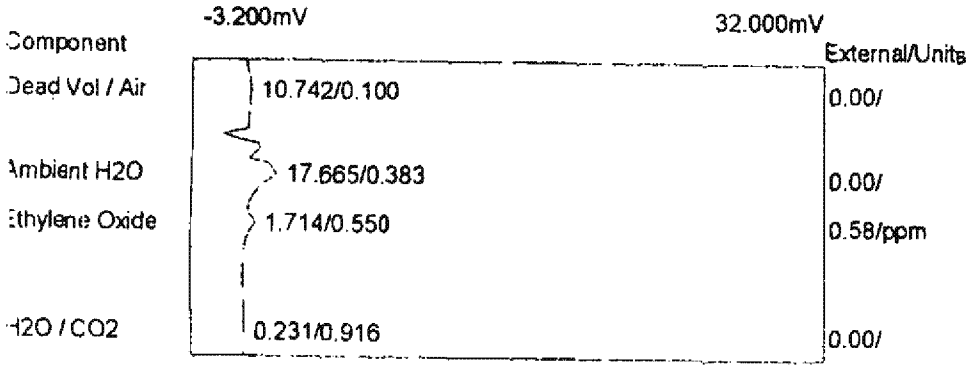
Client: IBAGriffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:51:02
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT4-A11.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	46.824	0.00	
Ethylene Oxide	0.550	4.794	1.95	ppm
		51.618	1.95	

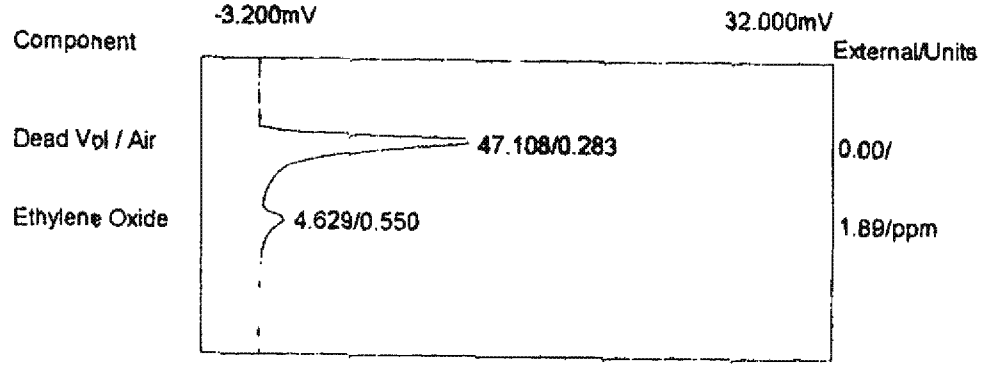
ED_002192_00004534-00182

Client: IBA/Griffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:56:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT4-A12.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	10.742	0.00	
Ambient H2O	0.383	17.665	0.00	
Ethylene Oxide	0.550	1.714	0.58	ppm
H2O / CO2	0.916	0.231	0.00	
		30.352	0.58	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#4Aer
Analysis date: 01/24/2003 14:56:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT4-A12.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



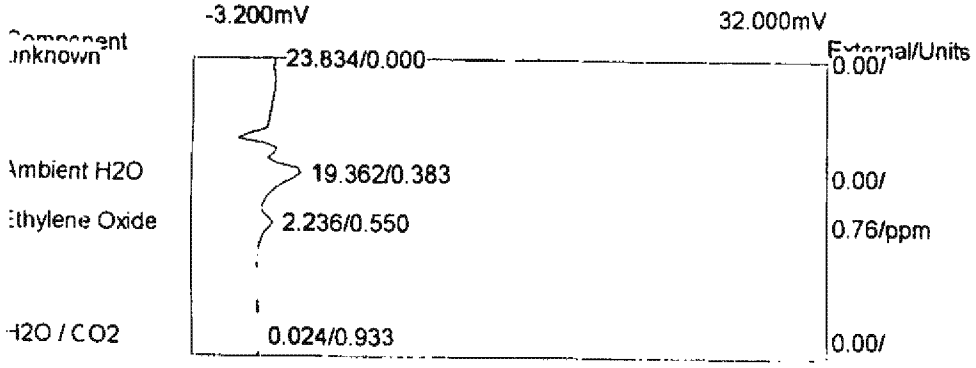
Component	Retention	Area	External	Units
Dead Vol / Air	0.283	47.108	0.00	
Ethylene Oxide	0.550	4.629	1.89	ppm
		51.737	1.89	

ED_002192_00004534-00183

APPENDIX L

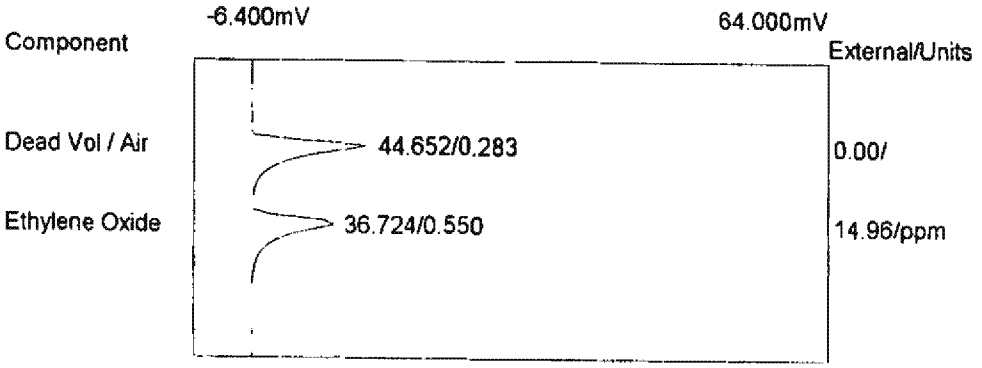
Plant 2 - Run #5 - Aeration Chromatograms - SC1 & SC2

Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:03:08
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT5-A01.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



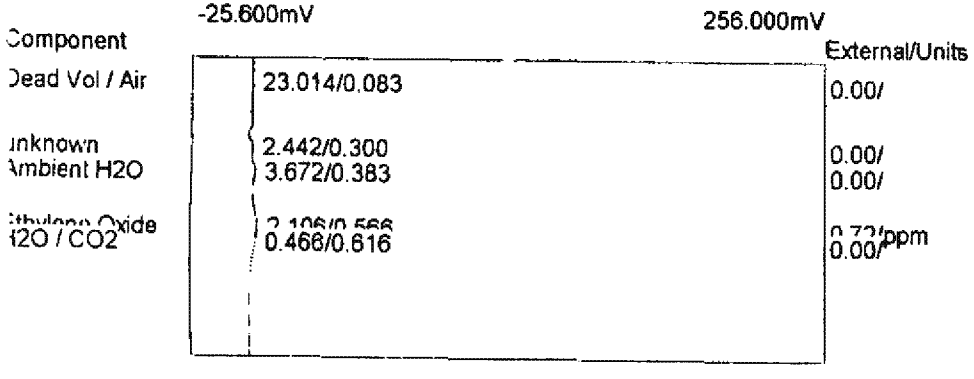
Component	Retention	Area	External	Units
Ambient H2O	0.383	19.362	0.00	
Ethylene Oxide	0.550	2.236	0.76	ppm
H2O / CO2	0.933	0.024	0.00	
		21.622	0.76	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:03:08
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT5-A01.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



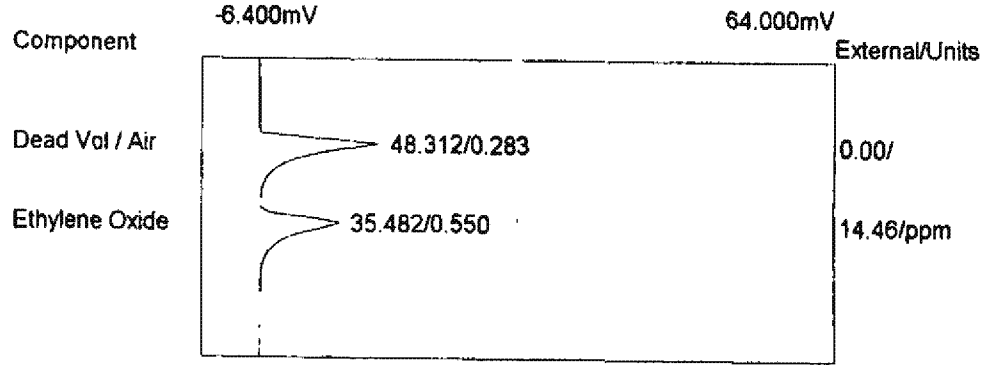
Component	Retention	Area	External	Units
Dead Vol / Air	0.283	44.652	0.00	
Ethylene Oxide	0.550	36.724	14.96	ppm
		81.376	14.96	

Client ID: Run#5Aer
Analysis date: 01/24/2003 15:08:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT5-A02.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	23.014	0.00	
Ambient H2O	0.383	3.672	0.00	
Ethylene Oxide	0.566	2.106	0.72	ppm
H2O / CO2	0.616	0.466	0.00	
		29.258	0.72	

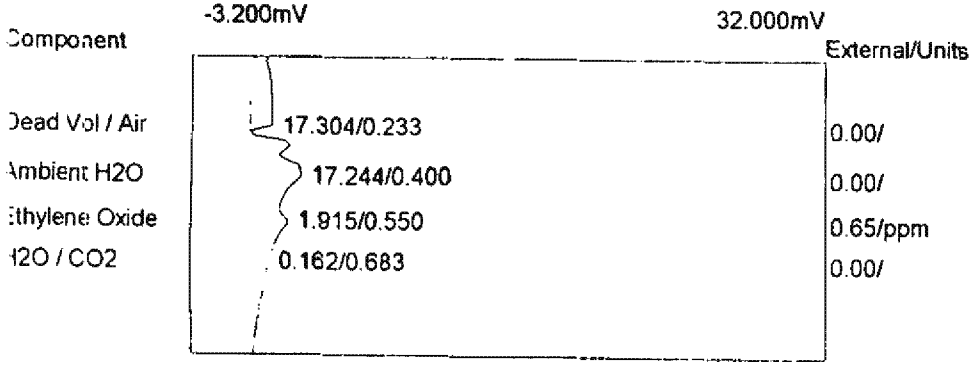
Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:08:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT5-A02.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	48.312	0.00	
Ethylene Oxide	0.550	35.482	14.46	ppm
		83.794	14.46	

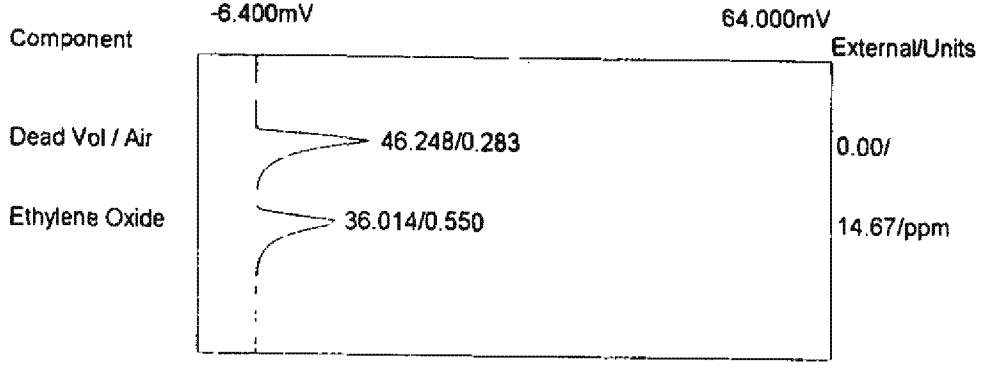
ED_002192_00004534-00186

Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:13:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT5-A03.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	17.304	0.00	
Ambient H2O	0.400	17.244	0.00	
Ethylene Oxide	0.550	1.915	0.65	ppm
H2O / CO2	0.683	0.162	0.00	
		36.625	0.65	

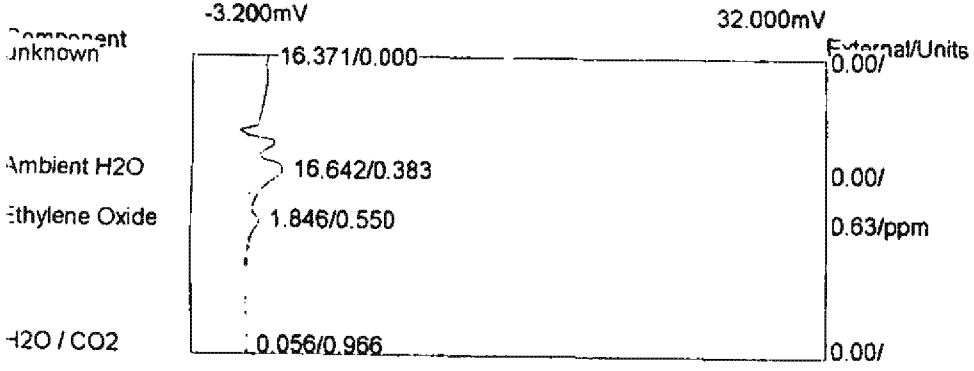
Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:13:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT5-A03.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	46.248	0.00	
Ethylene Oxide	0.550	36.014	14.67	ppm
		82.262	14.67	

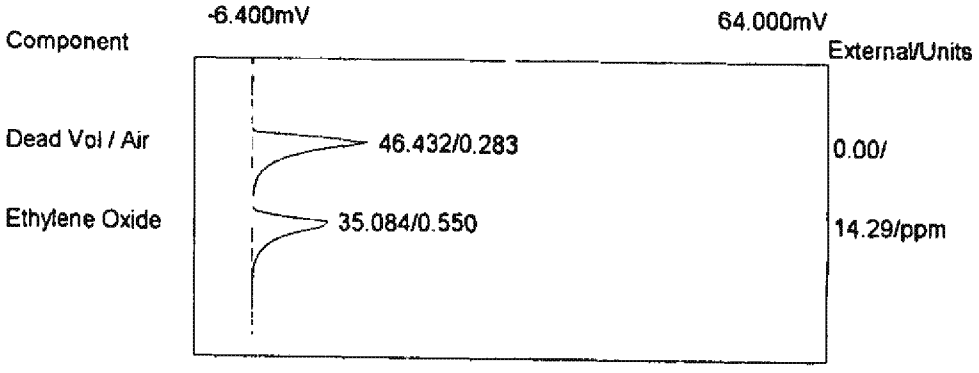
ED_002192_00004534-00187

Client ID: Run#5Aer
Analysis date: 01/24/2003 15:18:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT5-A04.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	16.642	0.00	
Ethylene Oxide	0.550	1.846	0.63	ppm
H2O / CO2	0.966	0.056	0.00	
		18.544	0.63	

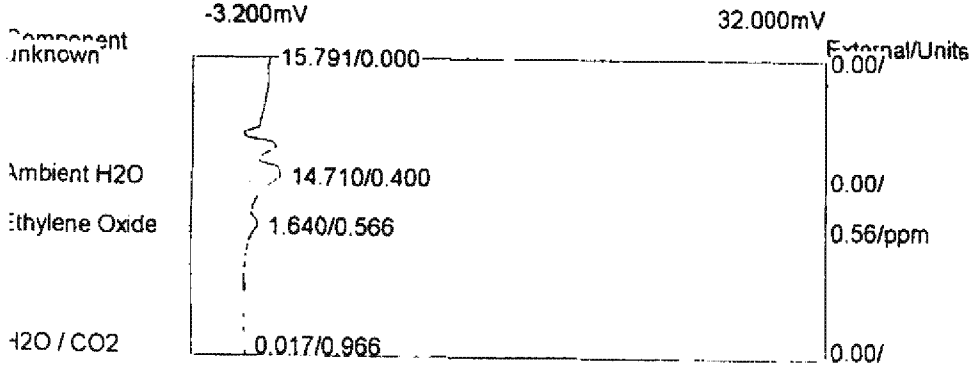
Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:18:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT5-A04.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	46.432	0.00	
Ethylene Oxide	0.550	35.084	14.29	ppm
		81.516	14.29	

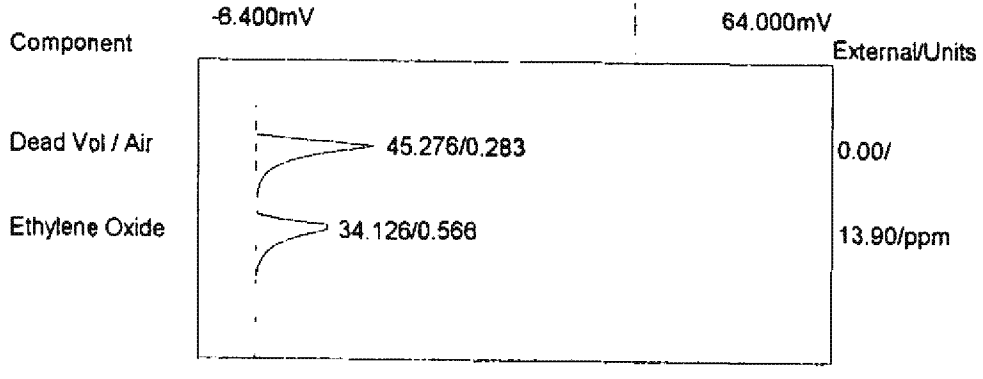
ED_002192_00004534-00188

Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:23:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT5-A05.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.400	14.710	0.00	
Ethylene Oxide	0.566	1.640	0.56	ppm
H2O / CO2	0.966	0.017	0.00	
		16.367	0.56	

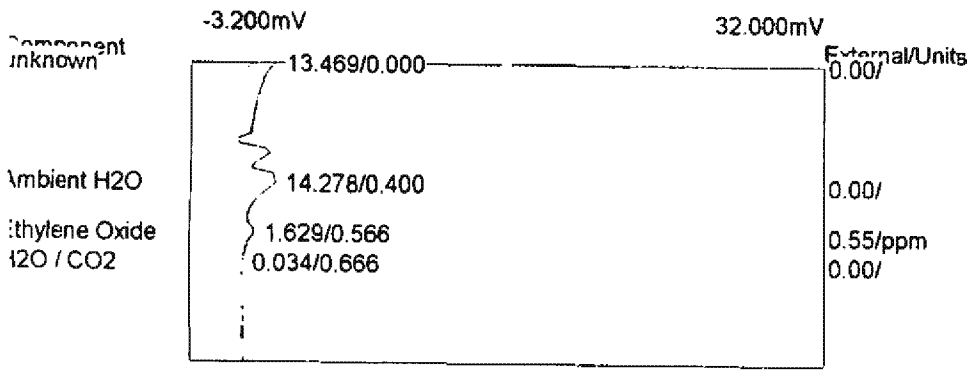
Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:23:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT5-A05.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	45.276	0.00	
Ethylene Oxide	0.566	34.126	13.90	ppm
		79.402	13.90	

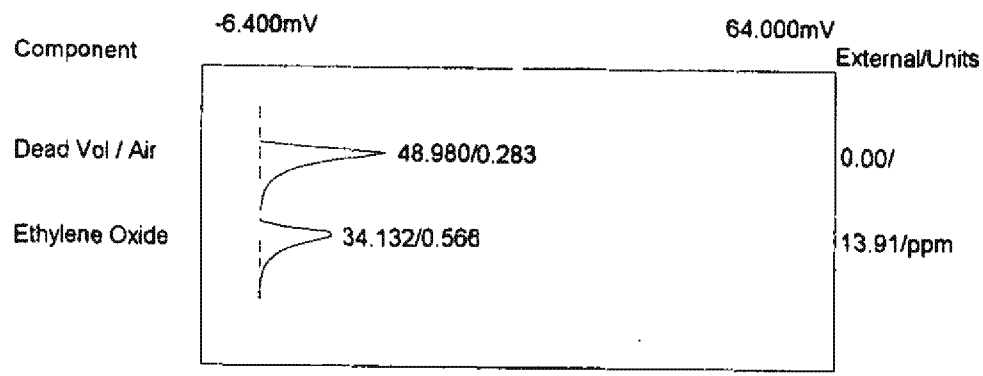
ED_002192_00004534-00189

Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:28:10
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT5-A06.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.400	14.278	0.00	
Ethylene Oxide	0.566	1.629	0.55	ppm
H2O / CO2	0.666	0.034	0.00	
		15.941	0.55	

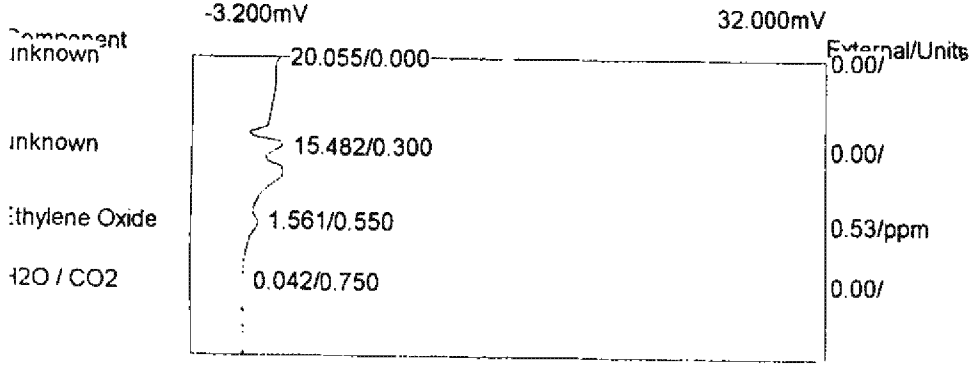
Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:28:10
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT5-A06.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	48.980	0.00	
Ethylene Oxide	0.566	34.132	13.91	ppm
		83.112	13.91	

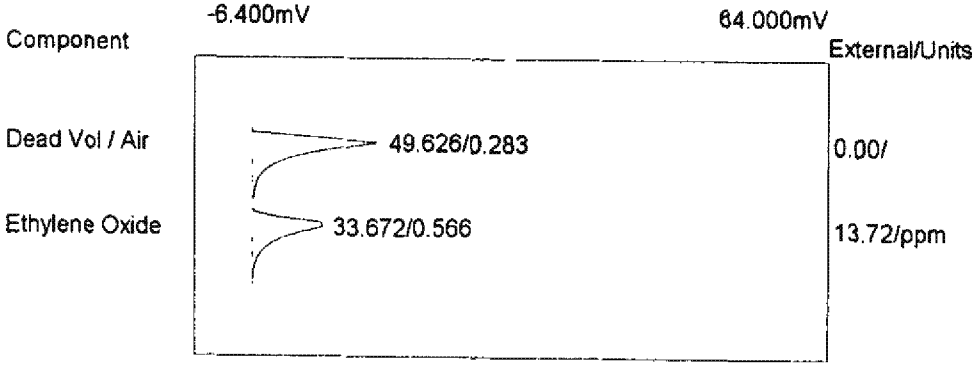
ED_002192_00004534-00190

Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:33:03
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT5-A07.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ethylene Oxide	0.550	1.561	0.53	ppm
H2O / CO2	0.750	0.042	0.00	
		1.603	0.53	

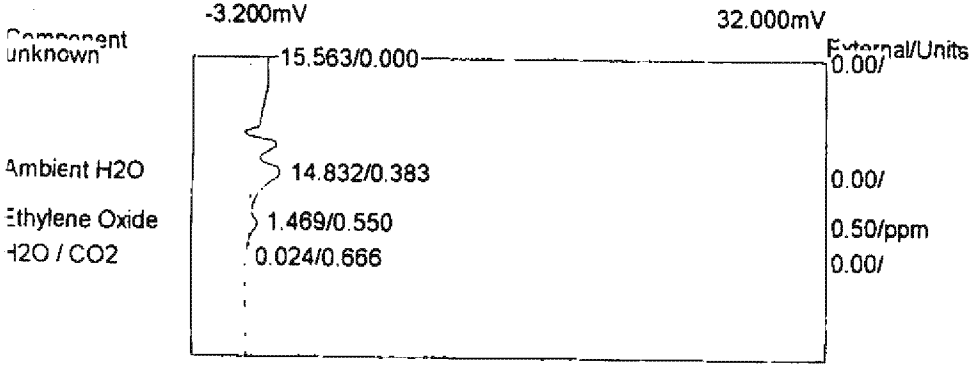
Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:33:03
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT5-A07.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	49.626	0.00	
Ethylene Oxide	0.566	33.672	13.72	ppm
		83.298	13.72	

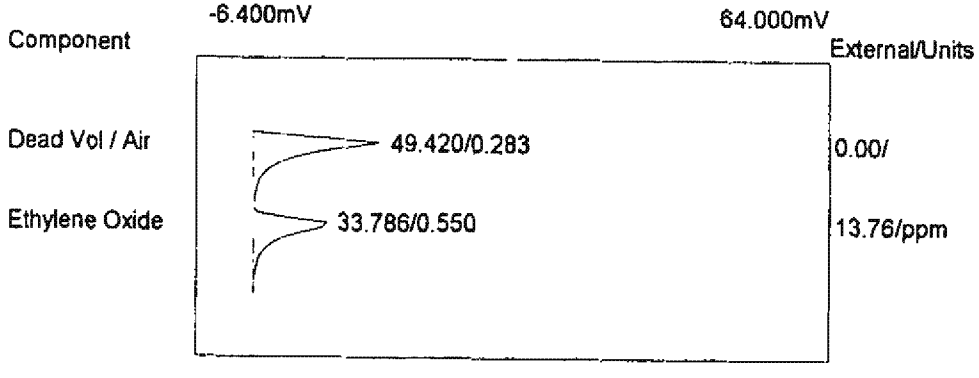
ED_002192_00004534-00191

Client ID: Run#5Aer
Analysis date: 01/24/2003 15:38:02
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT5-A08.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	14.832	0.00	
Ethylene Oxide	0.550	1.469	0.50	ppm
H2O / CO2	0.666	0.024	0.00	
		16.325	0.50	

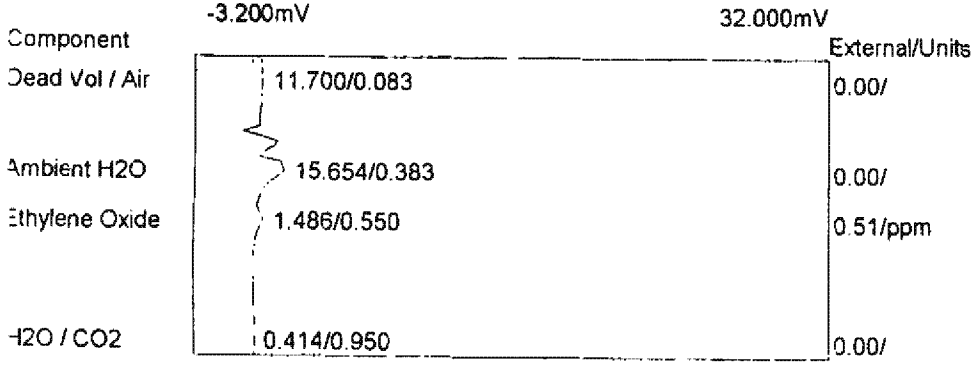
Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:38:02
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT5-A08.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	49.420	0.00	
Ethylene Oxide	0.550	33.786	13.76	ppm
		83.206	13.76	

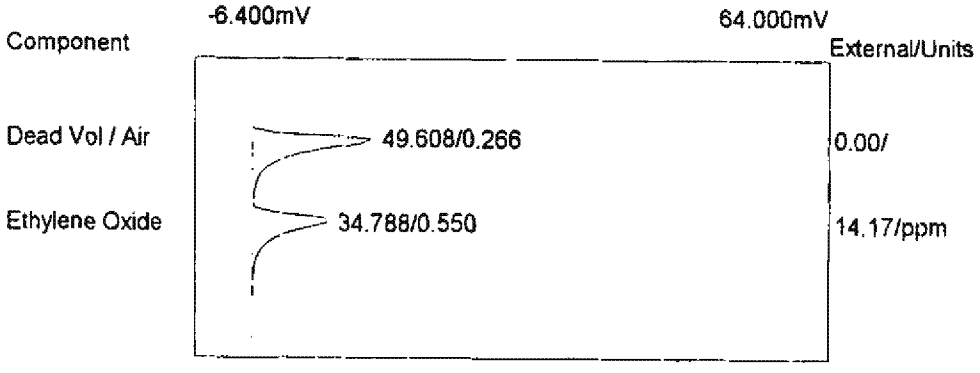
ED_002192_00004534-00192

Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:43:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT5-A09.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	11.700	0.00	
Ambient H2O	0.383	15.654	0.00	
Ethylene Oxide	0.550	1.486	0.51	ppm
H2O / CO2	0.950	0.414	0.00	
		29.254	0.51	

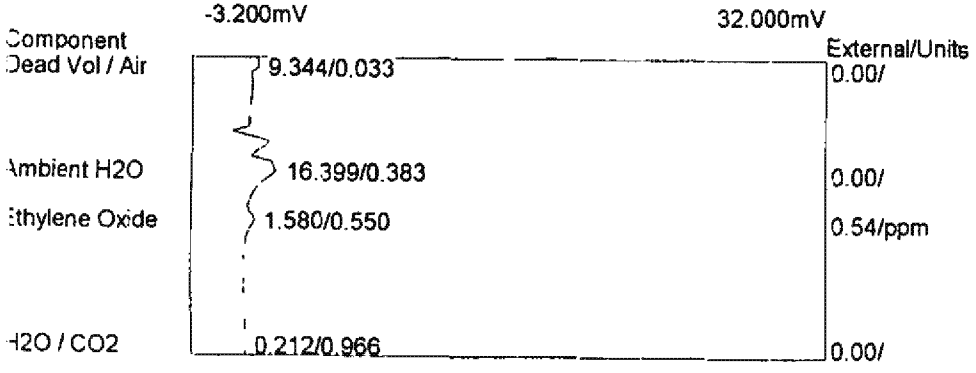
Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:43:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT5-A09.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	49.608	0.00	
Ethylene Oxide	0.550	34.788	14.17	ppm
		84.396	14.17	

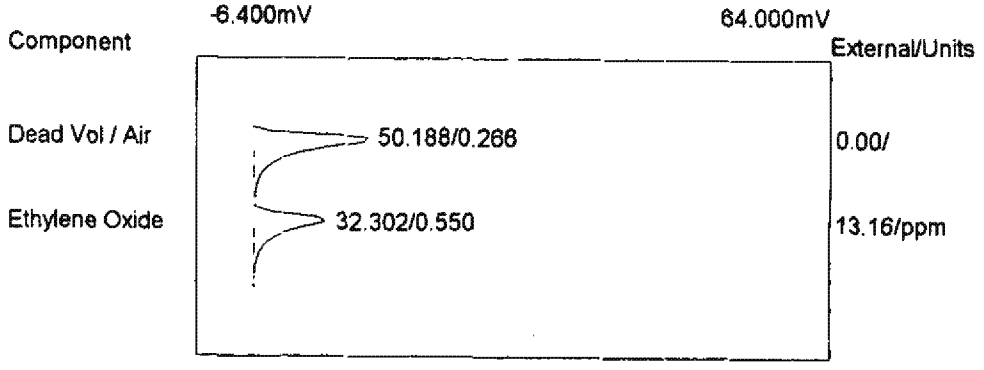
ED_002192_00004534-00193

Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:48:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT5-A10.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.033	9.344	0.00	
Ambient H2O	0.383	16.399	0.00	
Ethylene Oxide	0.550	1.580	0.54	ppm
H2O / CO2	0.966	0.212	0.00	
		27.535	0.54	

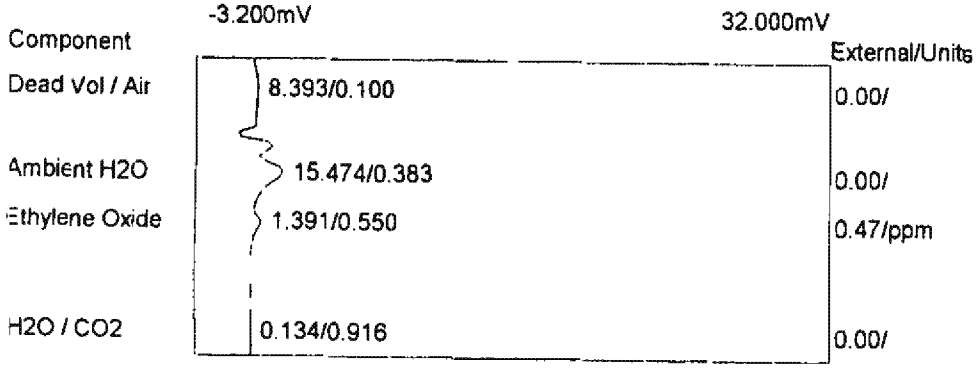
Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:48:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT5-A10.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	50.188	0.00	
Ethylene Oxide	0.550	32.302	13.16	ppm
		82.490	13.16	

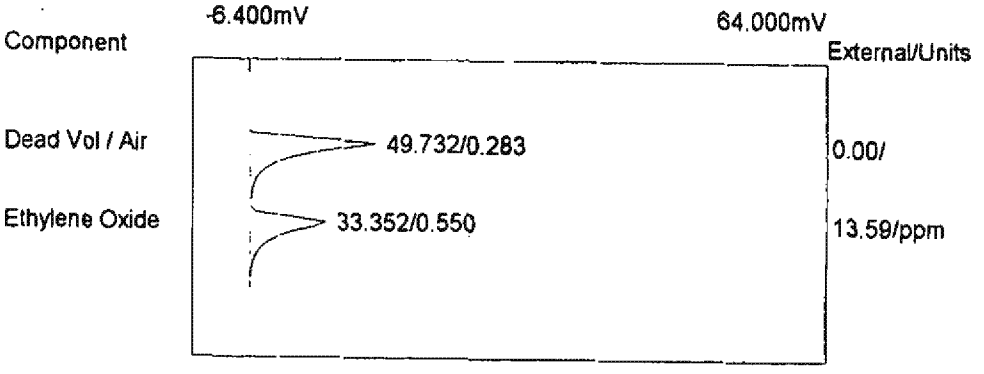
ED_002192_00004534-00194

Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:53:04
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT5-A11.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	8.393	0.00	
Ambient H2O	0.383	15.474	0.00	
Ethylene Oxide	0.550	1.391	0.47	ppm
H2O / CO2	0.916	0.134	0.00	
		25.392	0.47	

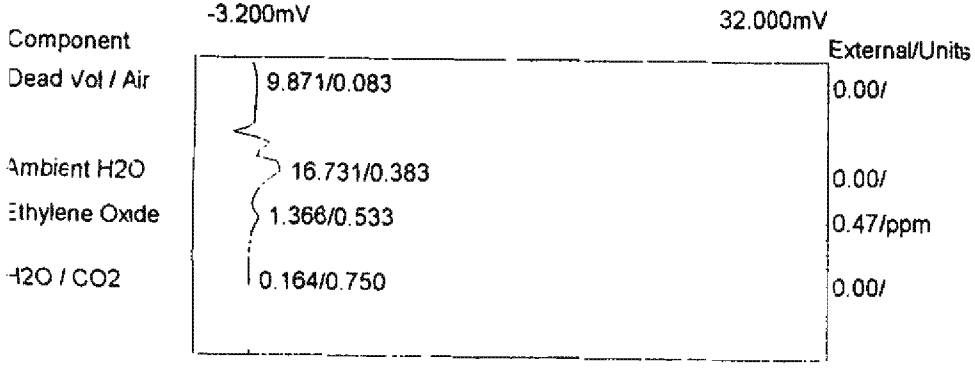
Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:53:04
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT5-A11.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	49.732	0.00	
Ethylene Oxide	0.550	33.352	13.59	ppm
		83.084	13.59	

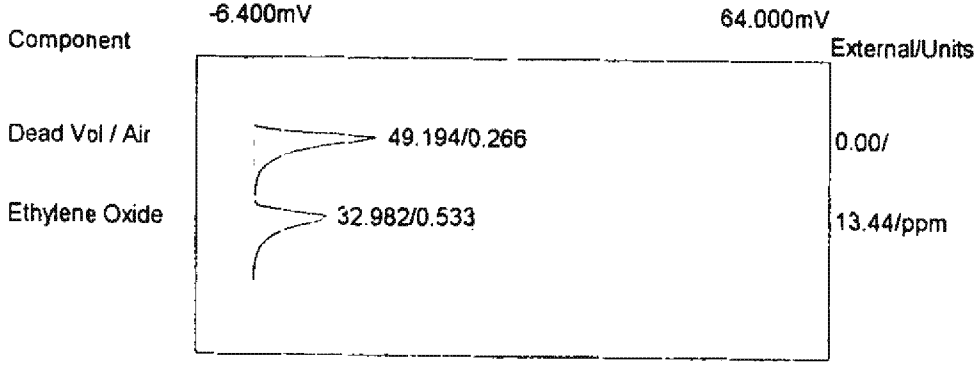
ED_002192_00004534-00195

Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:58:09
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT5-A12.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	9.871	0.00	
Ambient H2O	0.383	16.731	0.00	
Ethylene Oxide	0.533	1.366	0.47	ppm
H2O / CO2	0.750	0.164	0.00	
		28.132	0.47	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#5Aer
Analysis date: 01/24/2003 15:58:09
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT5-A12.CHR (c:\peakwin)
Sample: SC1 Inlet
Operator: D. Kremer



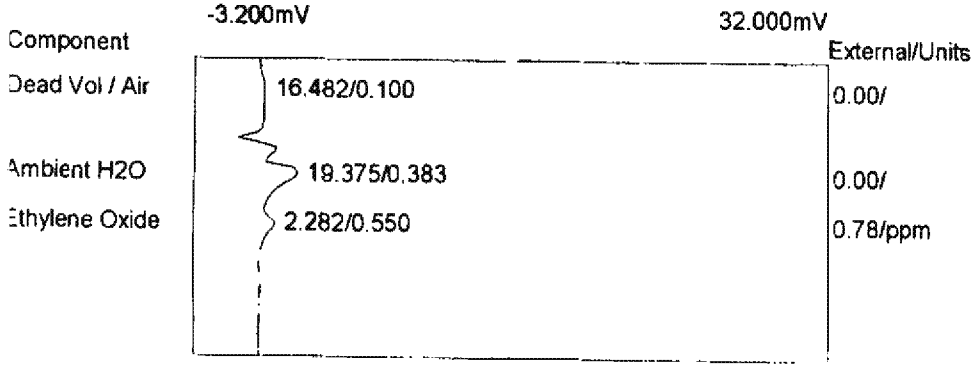
Component	Retention	Area	External	Units
Dead Vol / Air	0.266	49.194	0.00	
Ethylene Oxide	0.533	32.982	13.44	ppm
		82.176	13.44	

ED_002192_00004534-00196

APPENDIX M

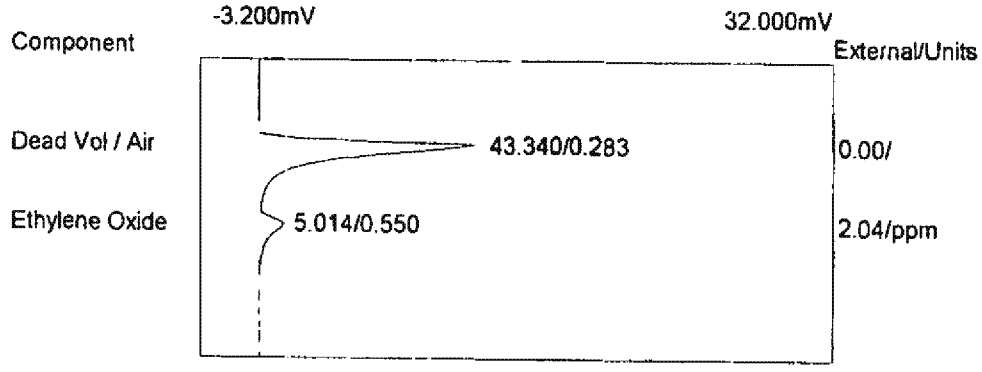
Plant 2 - Run #6 - Aeration Chromatograms - SC2 Only

Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:06:17
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT6-A01.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	16.482	0.00	
Ambient H2O	0.383	19.375	0.00	
Ethylene Oxide	0.550	2.282	0.78	ppm
		38.139	0.78	

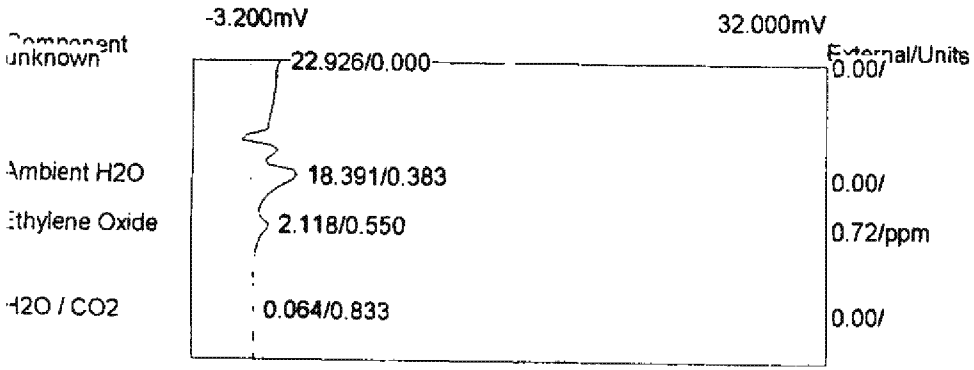
Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:06:17
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT6-A01.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	43.340	0.00	
Ethylene Oxide	0.550	5.014	2.04	ppm
		48.354	2.04	

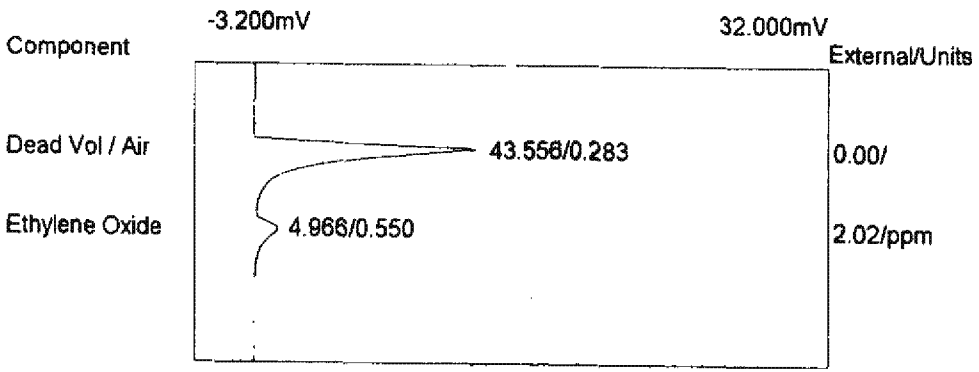
ED_002192_00004534-00198

Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:10:26
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT6-A02.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	18.391	0.00	
Ethylene Oxide	0.550	2.118	0.72	ppm
H2O / CO2	0.833	0.064	0.00	
		20.573	0.72	

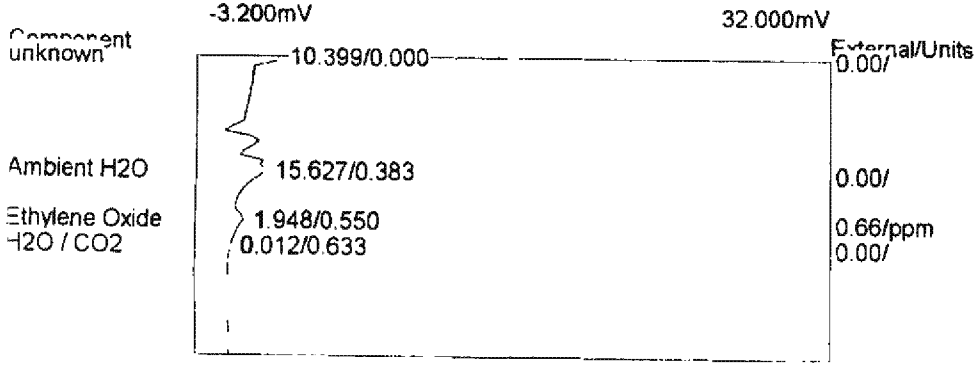
Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:10:26
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT6-A02.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	43.556	0.00	
Ethylene Oxide	0.550	4.966	2.02	ppm
		48.522	2.02	

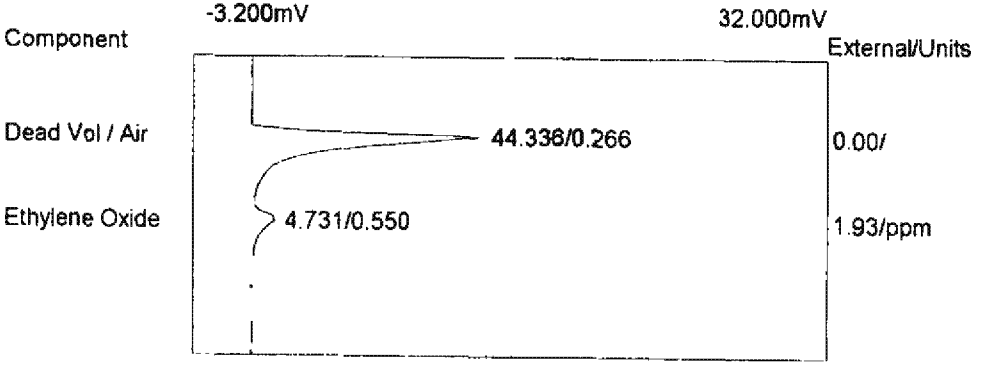
ED_002192_00004534-00199

Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:15:29
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT6-A03.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	15.627	0.00	
Ethylene Oxide	0.550	1.948	0.66	ppm
H2O / CO2	0.633	0.012	0.00	
		17.587	0.66	

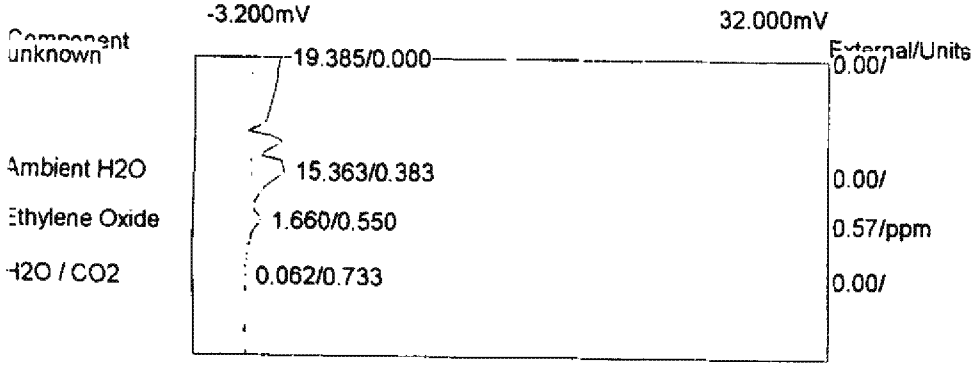
Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:15:29
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT6-A03.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	44.336	0.00	
Ethylene Oxide	0.550	4.731	1.93	ppm
		49.067	1.93	

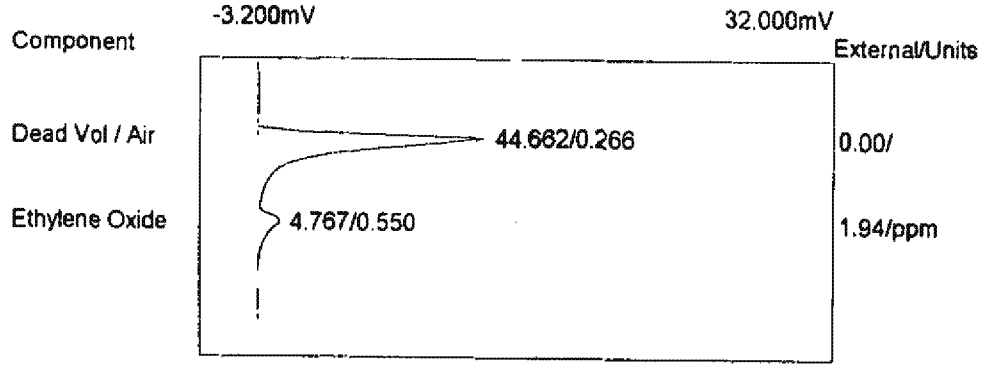
ED_002192_00004534-00200

Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:20:29
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT6-A04.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	15.363	0.00	
Ethylene Oxide	0.550	1.660	0.57	ppm
H2O / CO2	0.733	0.062	0.00	
		17.085	0.57	

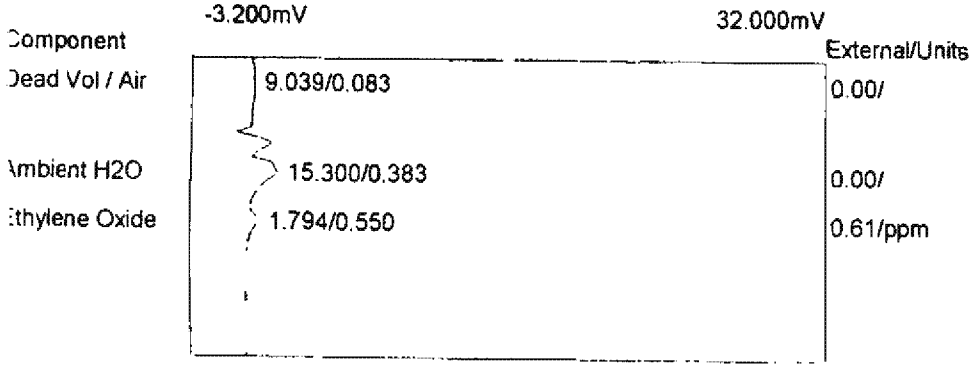
Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:20:29
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT6-A04.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	44.662	0.00	
Ethylene Oxide	0.550	4.767	1.94	ppm
		49.429	1.94	

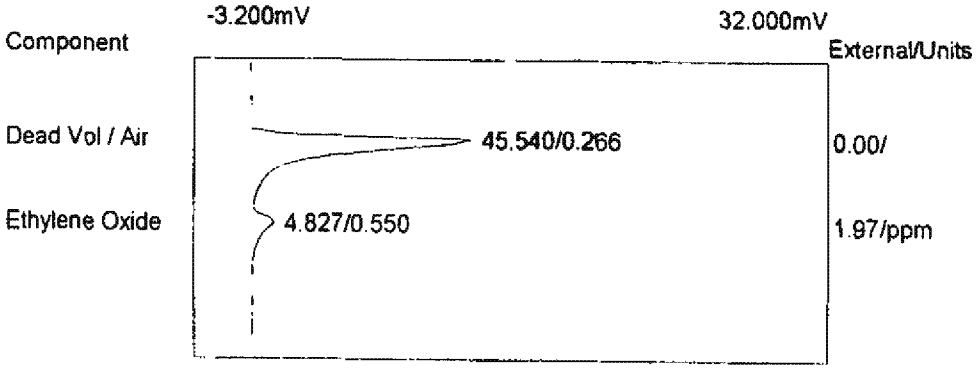
ED_002192_00004534-00201

Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:25:46
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT6-A05.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	9.039	0.00	
Ambient H2O	0.383	15.300	0.00	
Ethylene Oxide	0.550	1.794	0.61	ppm
		26.133	0.61	

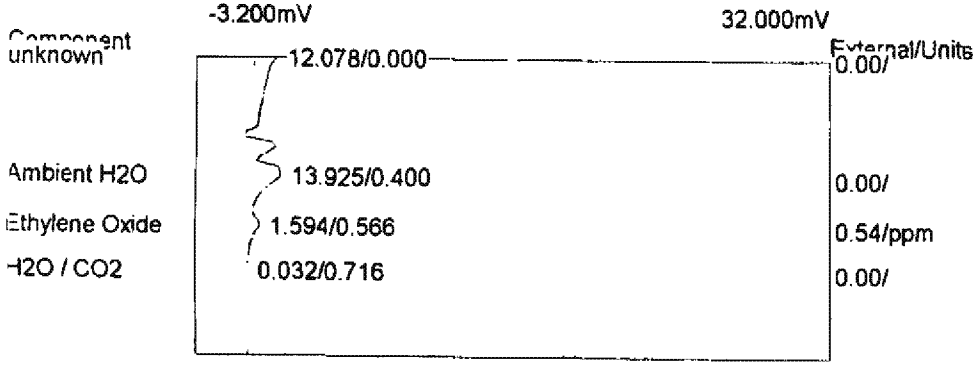
Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:25:46
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT6-A05.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	45.540	0.00	
Ethylene Oxide	0.550	4.827	1.97	ppm
		50.367	1.97	

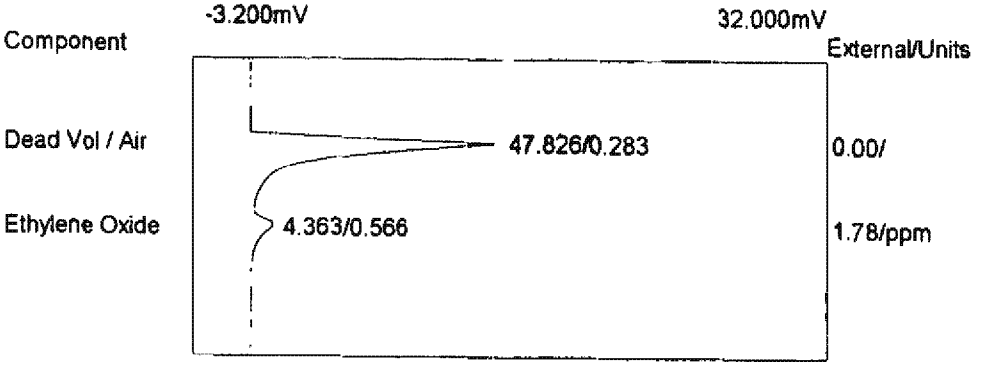
ED_002192_00004534-00202

Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:30:36
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT6-A06.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.400	13.925	0.00	
Ethylene Oxide	0.566	1.594	0.54	ppm
H2O / CO2	0.716	0.032	0.00	
		15.551	0.54	

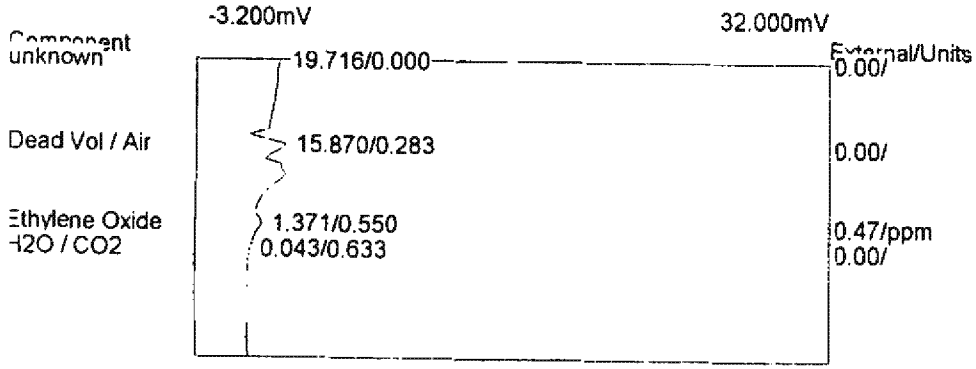
Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:30:36
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT6-A06.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	47.826	0.00	
Ethylene Oxide	0.566	4.363	1.78	ppm
		52.189	1.78	

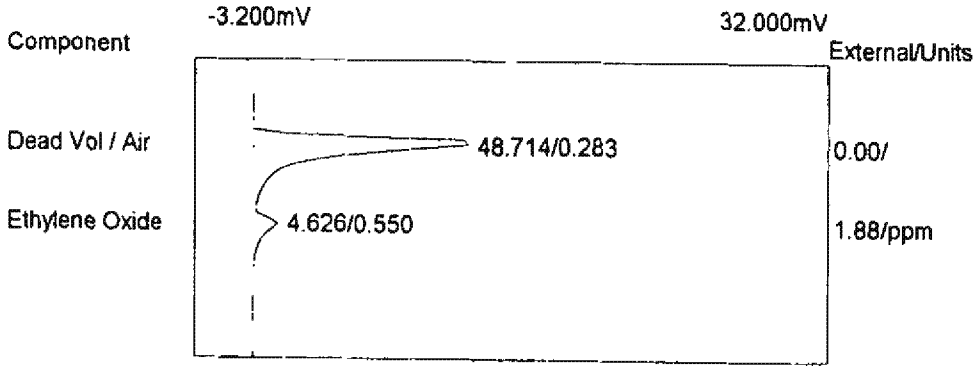
ED_002192_00004534-00203

Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:35:29
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT6-A07.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	15.870	0.00	
Ethylene Oxide	0.550	1.371	0.47	ppm
H2O / CO2	0.633	0.043	0.00	
		17.284	0.47	

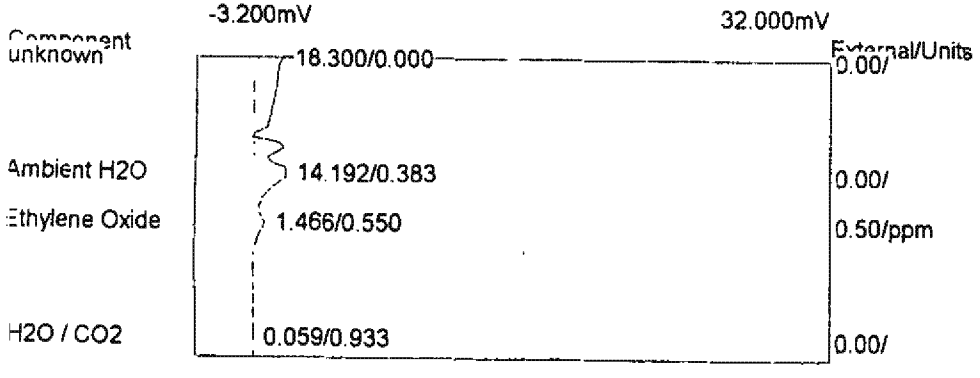
Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:35:29
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT6-A07.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	48.714	0.00	
Ethylene Oxide	0.550	4.626	1.88	ppm
		53.340	1.88	

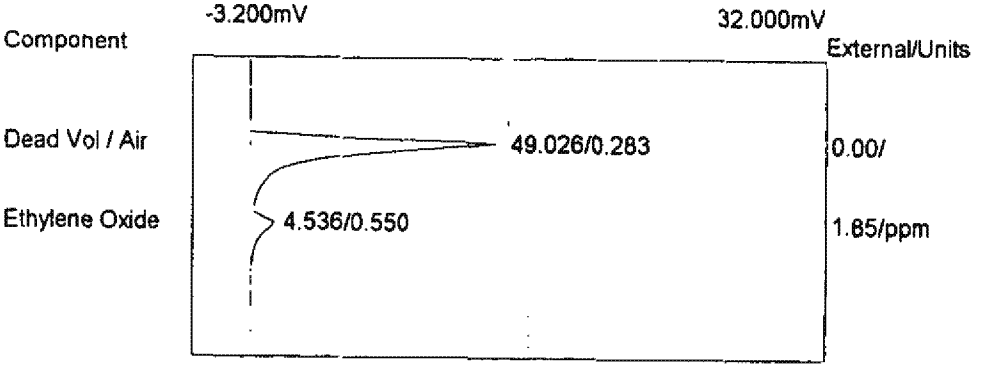
ED_002192_00004534-00204

Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:40:27
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT6-A08.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	14.192	0.00	
Ethylene Oxide	0.550	1.466	0.50	ppm
H2O / CO2	0.933	0.059	0.00	
		15.717	0.50	

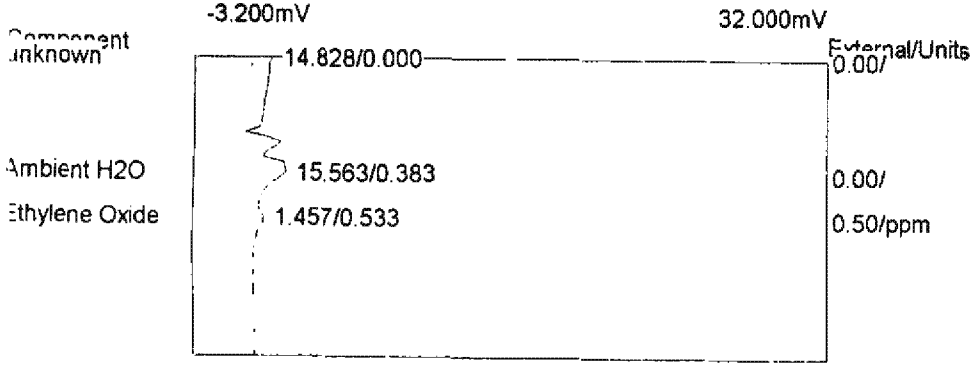
Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:40:27
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT6-A08.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	49.026	0.00	
Ethylene Oxide	0.550	4.536	1.85	ppm
		53.562	1.85	

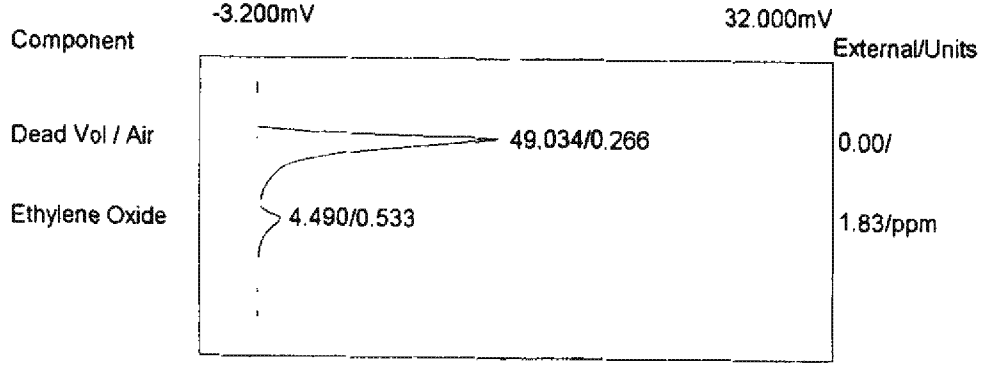
ED_002192_00004534-00205

Client: IBA/Griffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:45:24
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT6-A09.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	15.563	0.00	
Ethylene Oxide	0.533	1.457	0.50	ppm
		17.020	0.50	

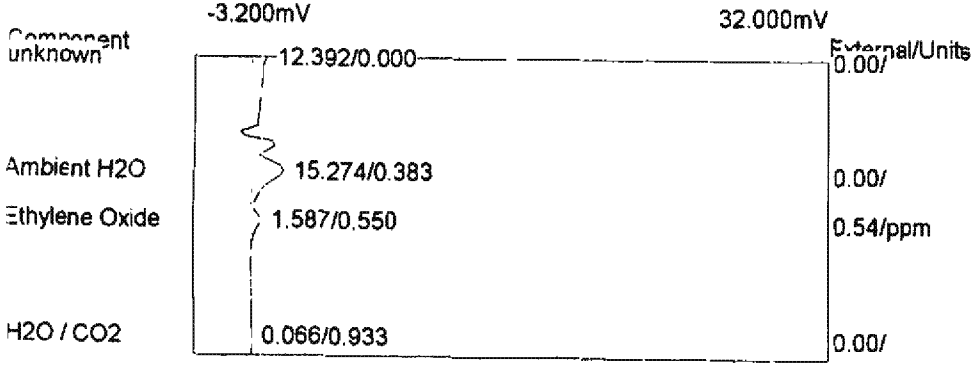
Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:45:24
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT6-A09.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.266	49.034	0.00	
Ethylene Oxide	0.533	4.490	1.83	ppm
		53.524	1.83	

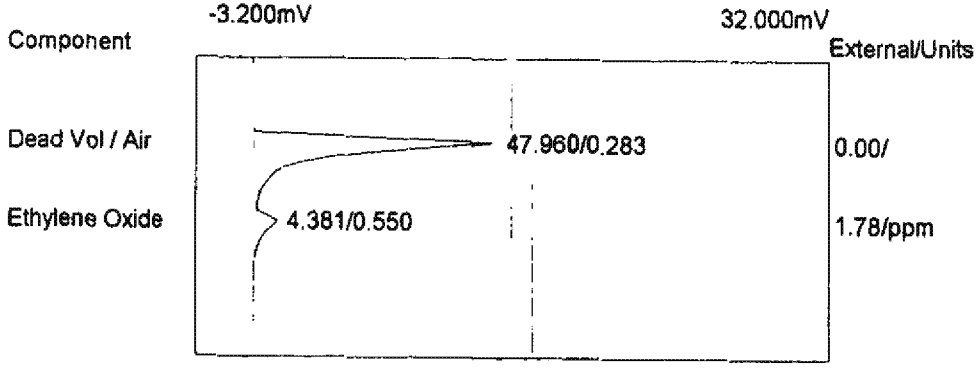
ED_002192_00004534-00206

Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:50:25
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT6-A10.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	15.274	0.00	
Ethylene Oxide	0.550	1.587	0.54	ppm
H2O / CO2	0.933	0.066	0.00	
		16.927	0.54	

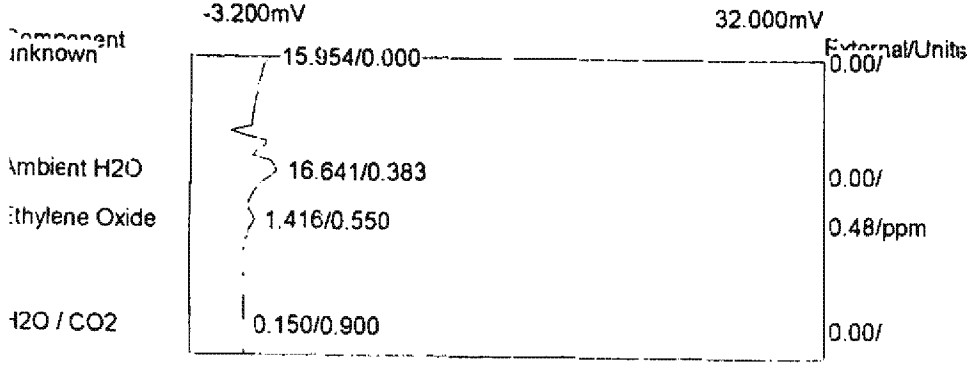
Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:50:25
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT6-A10.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	47.960	0.00	
Ethylene Oxide	0.550	4.381	1.78	ppm
		52.341	1.78	

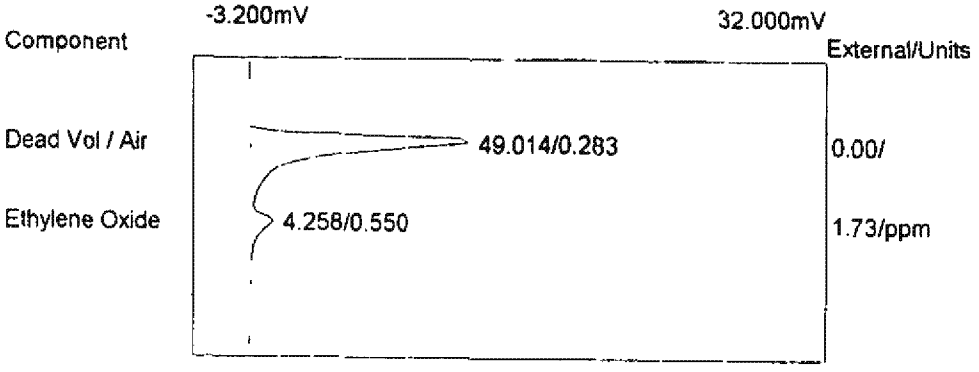
ED_002192_00004534-00207

Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:55:25
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT6-A11.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



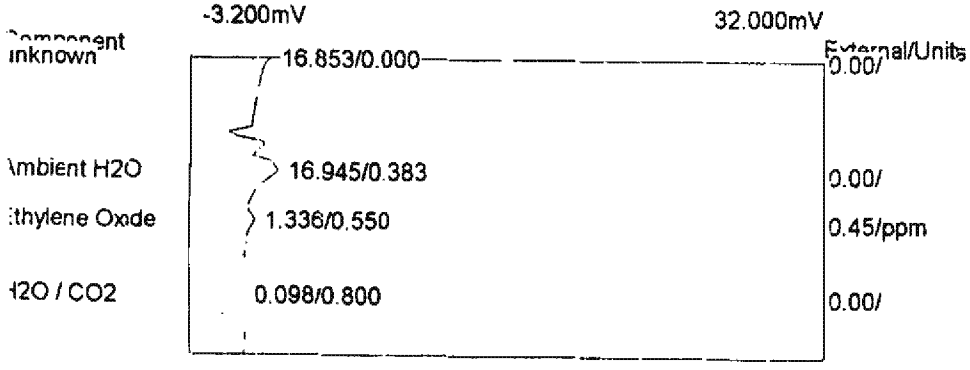
Component	Retention	Area	External	Units
Ambient H2O	0.383	16.641	0.00	
Ethylene Oxide	0.550	1.416	0.48	ppm
H2O / CO2	0.900	0.150	0.00	
		18.207	0.48	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 15:55:25
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT6-A11.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



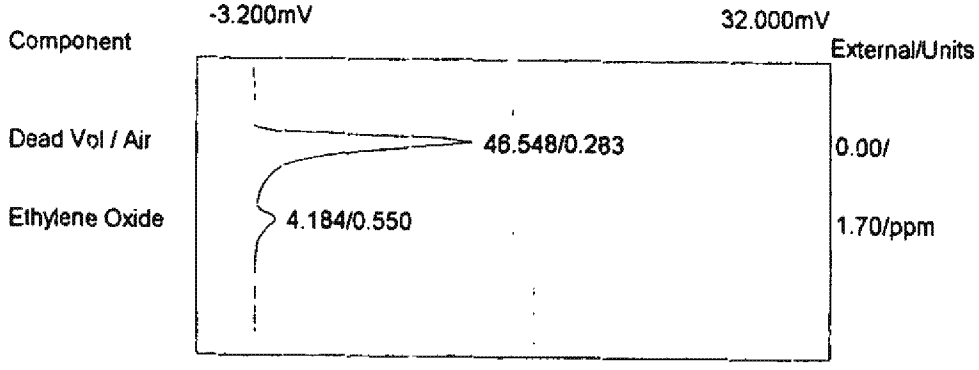
Component	Retention	Area	External	Units
Dead Vol / Air	0.283	49.014	0.00	
Ethylene Oxide	0.550	4.258	1.73	ppm
		53.272	1.73	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 16:00:30
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1GT6-A12.CHR (c:\peakwin)
Sample: SC2 Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Ambient H2O	0.383	16.945	0.00	
Ethylene Oxide	0.550	1.336	0.45	ppm
H2O / CO2	0.800	0.098	0.00	
		18.379	0.45	

Client: IBAGriffith-Willowbrook 2
Client ID: Run#6Aer
Analysis date: 01/24/2003 16:00:30
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2GT6-A12.CHR (c:\peakwin)
Sample: SC2 Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.283	46.548	0.00	
Ethylene Oxide	0.550	4.184	1.70	ppm
		50.732	1.70	

ED_002192_00004534-00209

APPENDIX N

Field Data and Calculation Worksheets

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 2
1/24/03 - Aeration Run #1 - SC1 Inlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.23	0.4796	80	16.4
0.23	0.4796	79	16.9
0.23	0.4796	79	16.5
0.23	0.4796	79	16.3
0.23	0.4796	79	16.4
0.23	0.4796	79	16.0
0.23	0.4796	79	17.3
0.23	0.4796	79	15.9
0.23	0.4796	79	16.2
0.23	0.4796	79	15.4
0.23	0.4796	79	16.4
0.23	0.4796	79	15.8
Average =			
0.23	0.4796	79.1	**16.29**
	=	539	degR

mw =	28.51	
stack area =	4.28	
press =	29.94	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	32.3	ft/sec
Flow =	7875	dscfm
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	0.0146670	lbs/min
EtO Mass Flow =	0.880023	lbs/hr
EtO Mass Flow =	21.1205	lbs/day

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 2
1/24/03 - Aeration Run #1 - SC2 Outlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.23	0.4796	80	0.78
0.23	0.4796	79	0.79
0.23	0.4796	79	0.79
0.23	0.4796	79	0.67
0.23	0.4796	79	0.72
0.23	0.4796	79	0.72
0.23	0.4796	79	0.77
0.23	0.4796	79	0.73
0.23	0.4796	79	0.69
0.23	0.4796	79	0.73
0.23	0.4796	79	0.74
0.23	0.4796	79	0.66
Average =			
0.23	0.4796	79.1	**0.73**
	=	539	degR

mw =	28.51	
stack area =	4.28	
press =	29.94	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	32.3	ft/sec
Flow =	**7875**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0006595**	**lbs/min**
EtO Mass Flow =	**0.039567**	**lbs/hr**
EtO Mass Flow =	**0.9496**	**lbs/day**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 2
1/24/03 - Aeration Run #2 - SC2 Inlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.23	0.4796	80	2.23
0.23	0.4796	79	2.11
0.23	0.4796	79	2.28
0.23	0.4796	79	2.16
0.23	0.4796	79	2.08
0.23	0.4796	79	2.91
0.23	0.4796	79	2.73
0.23	0.4796	79	1.62
0.23	0.4796	79	1.63
0.23	0.4796	79	2.8
0.23	0.4796	79	2.84
0.23	0.4796	79	2.12
Average =			
0.23	0.4796	79.1	2.29
	=	539	degR

mw =	28.51	
stack area =	4.28	
press =	29.94	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	32.3	ft/sec
Flow =	7875	dscfm
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	0.0020639	lbs/min
EtO Mass Flow =	0.123833	lbs/hr
EtO Mass Flow =	2.9720	lbs/day

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 2
1/24/03 - Aeration Run #2 - SC2 Outlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.23	0.4796	80	0.71
0.23	0.4796	79	0.77
0.23	0.4796	79	0.78
0.23	0.4796	79	0.79
0.23	0.4796	79	0.68
0.23	0.4796	79	0.74
0.23	0.4796	79	0.81
0.23	0.4796	79	0.67
0.23	0.4796	79	0.71
0.23	0.4796	79	0.74
0.23	0.4796	79	0.65
0.23	0.4796	79	0.63
Average =			
0.23	0.4796	79.1	0.72
	=	539	degR

mw =	28.51	
stack area =	4.28	
press =	29.94	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	32.3	ft/sec
Flow =	7875	dscfm
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	0.0006512	lbs/min
EtO Mass Flow =	0.039072	lbs/hr
EtO Mass Flow =	0.9377	lbs/day

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 2
1/24/03 - Aeration Run #3 - SC1 Inlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.23	0.4796	79	16.7
0.23	0.4796	79	15.8
0.23	0.4796	79	16.0
0.23	0.4796	79	14.8
0.23	0.4796	79	14.8
0.23	0.4796	79	15.0
0.23	0.4796	79	14.7
0.23	0.4796	79	14.8
0.23	0.4796	79	14.3
0.23	0.4796	80	14.5
0.23	0.4796	80	14.6
0.23	0.4796	80	14.9
Average =			
0.23	0.4796	79.3	**15.08**
	=	539	degR

mw =	28.51	
stack area =	4.28	
press =	29.94	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	32.3	ft/sec
Flow =	7874	dscfm
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	0.0135696	lbs/min
EtO Mass Flow =	0.814177	lbs/hr
EtO Mass Flow =	19.5402	lbs/day

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 2
1/24/03 - Aeration Run #3 - SC2 Outlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.23	0.4796	79	0.71
0.23	0.4796	79	0.64
0.23	0.4796	79	0.61
0.23	0.4796	79	0.60
0.23	0.4796	79	0.54
0.23	0.4796	79	0.61
0.23	0.4796	79	0.68
0.23	0.4796	79	0.58
0.23	0.4796	79	0.54
0.23	0.4796	80	0.61
0.23	0.4796	80	0.65
0.23	0.4796	80	0.64
Average =			
0.23	0.4796	79.3	0.62
	=	539	degR

mw =	28.51	
stack area =	4.28	
press =	29.94	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	32.3	ft/sec
Flow =	7874	dscfm
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	0.0005558	lbs/min
EtO Mass Flow =	0.033350	lbs/hr
EtO Mass Flow =	0.8004	lbs/day

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 2
1/24/03 - Aeration Run #4 - SC2 Inlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.23	0.4796	79	2.13
0.23	0.4796	79	1.97
0.23	0.4796	79	2.04
0.23	0.4796	79	1.85
0.23	0.4796	79	1.92
0.23	0.4796	79	1.89
0.23	0.4796	79	2.07
0.23	0.4796	79	1.92
0.23	0.4796	79	1.81
0.23	0.4796	80	1.92
0.23	0.4796	80	1.95
0.23	0.4796	80	1.89
Average =			
0.23	0.4796	79.3	1.95
	=	539	degR

mw =	28.51	
stack area =	4.28	
press =	29.94	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	32.3	ft/sec
Flow =	7874	dscfm
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	0.0017523	lbs/min
EtO Mass Flow =	0.105136	lbs/hr
EtO Mass Flow =	2.5233	lbs/day

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 2
1/24/03 - Aeration Run #4 - SC2 Outlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.23	0.4796	79	0.66
0.23	0.4796	79	0.65
0.23	0.4796	79	0.62
0.23	0.4796	79	0.59
0.23	0.4796	79	0.61
0.23	0.4796	79	0.58
0.23	0.4796	79	0.58
0.23	0.4796	79	0.63
0.23	0.4796	79	0.63
0.23	0.4796	80	0.66
0.23	0.4796	80	0.60
0.23	0.4796	80	0.58
Average =			
0.23	0.4796	79.3	**0.62**
	=	539	degR

mw =	28.51	
stack area =	4.28	
press =	29.94	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	32.3	ft/sec
Flow =	7874	dscfm
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0005543**	lbs/min
EtO Mass Flow =	**0.033260**	lbs/hr
EtO Mass Flow =	**0.7982**	lbs/day

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 2
1/24/03 - Aeration Run #5 - SC1 Inlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.23	0.4796	79	15.0
0.23	0.4796	80	14.5
0.23	0.4796	80	14.7
0.23	0.4796	80	14.3
0.23	0.4796	80	13.9
0.23	0.4796	80	13.9
0.23	0.4796	80	13.7
0.23	0.4796	80	13.8
0.23	0.4796	80	14.2
0.23	0.4796	80	13.2
0.23	0.4796	79	13.6
0.23	0.4796	79	13.4
Average =			
0.23	0.4796	79.8	14.02
	=	540	degR

mw =	28.51	
stack area =	4.28	
press =	29.94	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	32.3	ft/sec
Flow =	7870	dscfm
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	0.0126111	lbs/min
EtO Mass Flow =	0.756667	lbs/hr
EtO Mass Flow =	18.1600	lbs/day

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 2
1/24/03 - Aeration Run #5 - SC2 Outlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.23	0.4796	79	0.76
0.23	0.4796	80	0.72
0.23	0.4796	80	0.65
0.23	0.4796	80	0.63
0.23	0.4796	80	0.56
0.23	0.4796	80	0.55
0.23	0.4796	80	0.53
0.23	0.4796	80	0.50
0.23	0.4796	80	0.51
0.23	0.4796	80	0.54
0.23	0.4796	79	0.47
0.23	0.4796	79	0.47
Average =			
0.23	0.4796	79.8	**0.57**
	=	540	degR

mw =	28.51	
stack area =	4.28	
press =	29.94	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	32.3	ft/sec
Flow =	**7870**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0005166**	**lbs/min**
EtO Mass Flow =	**0.030995**	**lbs/hr**
EtO Mass Flow =	**0.7439**	**lbs/day**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 2
1/24/03 - Aeration Run #6 - SC2 Inlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.23	0.4796	79	2.04
0.23	0.4796	80	2.02
0.23	0.4796	80	1.93
0.23	0.4796	80	1.94
0.23	0.4796	80	1.97
0.23	0.4796	80	1.78
0.23	0.4796	80	1.88
0.23	0.4796	80	1.85
0.23	0.4796	80	1.83
0.23	0.4796	80	1.78
0.23	0.4796	79	1.73
0.23	0.4796	79	1.70
Average =			
0.23	0.4796	79.8	1.87
	=	540	degR

mw =	28.51	
stack area =	4.28	
press =	29.94	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	32.3	ft/sec
Flow =	7870	dscfm
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	0.0016832	lbs/min
EtO Mass Flow =	0.100994	lbs/hr
EtO Mass Flow =	2.4239	lbs/day

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 2
1/24/03 - Aeration Run #6 - SC2 Outlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.23	0.4796	79	0.78
0.23	0.4796	80	0.72
0.23	0.4796	80	0.66
0.23	0.4796	80	0.57
0.23	0.4796	80	0.61
0.23	0.4796	80	0.54
0.23	0.4796	80	0.47
0.23	0.4796	80	0.50
0.23	0.4796	80	0.50
0.23	0.4796	80	0.54
0.23	0.4796	79	0.48
0.23	0.4796	79	0.45
Average =			
0.23	0.4796	79.8	0.57
	=	540	degR

mw =	28.51	
stack area =	4.28	
press =	29.94	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	32.3	ft/sec
Flow =	7870	dscfm
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	0.0005113	lbs/min
EtO Mass Flow =	0.030681	lbs/hr
EtO Mass Flow =	0.7363	lbs/day

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 1
1/23/03 - Aeration Run #1 - SC1 Inlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.21	0.4583	116	74.8
0.21	0.4583	116	75.7
0.21	0.4583	117	76.2
0.21	0.4583	117	77.1
0.21	0.4583	117	75.8
0.21	0.4583	117	76.4
0.21	0.4583	114	74.5
0.21	0.4583	113	72.5
0.21	0.4583	112	75.0
0.21	0.4583	111	77.3
0.21	0.4583	112	77.8
0.21	0.4583	113	81.2
Average =			
0.21	0.4583	114.6	**76.19**
	=	575	degR

mw =	28.51	
stack area =	7.07	
press =	29.90	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	31.8	ft/sec
Flow =	**12032**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.1048014**	**lbs/min**
EtO Mass Flow =	**6.288**	**lbs/hr**
EtO Mass Flow =	**150.9**	**lbs/day**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 1
1/23/03 - Aeration Run #1 - SC2 Outlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.21	0.4583	116	0.01
0.21	0.4583	116	0.01
0.21	0.4583	117	0.01
0.21	0.4583	117	0.01
0.21	0.4583	117	0.01
0.21	0.4583	117	0.01
0.21	0.4583	114	0.01
0.21	0.4583	113	0.01
0.21	0.4583	112	0.01
0.21	0.4583	111	0.01
0.21	0.4583	112	0.01
0.21	0.4583	113	0.01
Average =			
0.21	0.4583	114.6	**0.01**
	=	575	degR

mw =	28.51	
stack area =	7.07	
press =	29.90	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	31.8	ft/sec
Flow =	**12032**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0000138**	**lbs/min**
EtO Mass Flow =	**0.000825**	**lbs/hr**
EtO Mass Flow =	**0.0198**	**lbs/day**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 1
1/23/03 - Aeration Run #2 - SC1 Inlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.21	0.4583	112	89.7
0.21	0.4583	113	91.4
0.21	0.4583	113	89.4
0.21	0.4583	113	92.4
0.21	0.4583	113	93.0
0.21	0.4583	113	93.1
0.21	0.4583	114	93.0
0.21	0.4583	113	93.1
0.21	0.4583	112	87.9
0.21	0.4583	110	85.2
0.21	0.4583	111	82.8
0.21	0.4583	110	84.1
Average =			
0.21	0.4583	112.3	**89.59**
	=	572	degR

mw =	28.51	
stack area =	7.07	
press =	29.90	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	31.8	ft/sec
Flow =	**12056**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.1234841**	**lbs/min**
EtO Mass Flow =	**7.409**	**lbs/hr**
EtO Mass Flow =	**177.8**	**lbs/day**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 1
1/23/03 - Aeration Run #2 - SC2 Outlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.21	0.4583	112	0.01
0.21	0.4583	113	0.01
0.21	0.4583	113	0.01
0.21	0.4583	113	0.01
0.21	0.4583	113	0.01
0.21	0.4583	113	0.01
0.21	0.4583	114	0.01
0.21	0.4583	113	0.01
0.21	0.4583	112	0.01
0.21	0.4583	110	0.01
0.21	0.4583	111	0.01
0.21	0.4583	110	0.01
Average =			
0.21	0.4583	112.3	**0.01**
	=	572	degR

mw =	28.51	
stack area =	7.07	
press =	29.90	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	31.8	ft/sec
Flow =	**12056**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0000138**	**lbs/min**
EtO Mass Flow =	**0.000827**	**lbs/hr**
EtO Mass Flow =	**0.0198**	**lbs/day**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 1
1/23/03 - Aeration Run #3 - SC1 Inlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.21	0.4583	109	91.3
0.21	0.4583	108	80.9
0.21	0.4583	108	79.2
0.21	0.4583	109	76.5
0.21	0.4583	110	73.7
0.21	0.4583	109	67.3
0.21	0.4583	109	65.6
0.21	0.4583	108	68.5
0.21	0.4583	108	69.9
0.21	0.4583	108	70.0
0.21	0.4583	108	71.0
0.21	0.4583	108	69.8
Average =			
0.21	0.4583	108.5	**73.64**
	=	569	degR

mw =	28.51	
stack area =	7.07	
press =	29.90	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	31.7	ft/sec
Flow =	**12096**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.1018344**	**lbs/min**
EtO Mass Flow =	**6.110**	**lbs/hr**
EtO Mass Flow =	**146.6**	**lbs/day**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 1
1/23/03 - Aeration Run #3 - SC2 Outlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.21	0.4583	109	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	109	0.01
0.21	0.4583	110	0.01
0.21	0.4583	109	0.01
0.21	0.4583	109	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
Average =			
0.21	0.4583	108.5	**0.01**
	=	569	degR

mw =	28.51	
stack area =	7.07	
press =	29.90	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	31.7	ft/sec
Flow =	**12096**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0000138**	**lbs/min**
EtO Mass Flow =	**0.000830**	**lbs/hr**
EtO Mass Flow =	**0.0199**	**lbs/day**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 1
1/23/03 - Aeration Run #4 - SC2 Inlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.21	0.4583	109	8.32
0.21	0.4583	107	8.08
0.21	0.4583	108	7.87
0.21	0.4583	107	7.96
0.21	0.4583	108	7.98
0.21	0.4583	108	8.24
0.21	0.4583	109	7.82
0.21	0.4583	109	7.66
0.21	0.4583	109	7.88
0.21	0.4583	108	8.01
0.21	0.4583	109	7.70
0.21	0.4583	109	7.91
Average =			
0.21	0.4583	108.3	**7.95**
	=	568	degR

mw =	28.51	
stack area =	7.07	
press =	29.90	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	31.7	ft/sec
Flow =	**12098**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0109986**	**lbs/min**
EtO Mass Flow =	**0.660**	**lbs/hr**
EtO Mass Flow =	**15.8**	**lbs/day**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 1
1/23/03 - Aeration Run #4 - SC2 Outlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.21	0.4583	109	0.01
0.21	0.4583	107	0.01
0.21	0.4583	108	0.01
0.21	0.4583	107	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	109	0.01
0.21	0.4583	109	0.01
0.21	0.4583	109	0.01
0.21	0.4583	108	0.01
0.21	0.4583	109	0.01
0.21	0.4583	109	0.01
Average =			
0.21	0.4583	108.3	**0.01**
	=	568	degR

mw =	28.51	
stack area =	7.07	
press =	29.90	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	31.7	ft/sec
Flow =	**12098**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0000138**	**lbs/min**
EtO Mass Flow =	**0.000830**	**lbs/hr**
EtO Mass Flow =	**0.0199**	**lbs/day**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 1
1/23/03 - Aeration Run #5 - SC2 Inlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.21	0.4583	109	7.90
0.21	0.4583	108	8.36
0.21	0.4583	108	8.62
0.21	0.4583	108	8.83
0.21	0.4583	108	9.16
0.21	0.4583	108	9.49
0.21	0.4583	108	9.54
0.21	0.4583	108	9.43
0.21	0.4583	108	9.55
0.21	0.4583	108	9.72
0.21	0.4583	108	9.78
0.21	0.4583	108	9.89
Average =			
0.21	0.4583	108.1	**9.19**
	=	568	degR

mw =	28.51	
stack area =	7.07	
press =	29.90	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	31.7	ft/sec
Flow =	**12101**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0127118**	**lbs/min**
EtO Mass Flow =	**0.763**	**lbs/hr**
EtO Mass Flow =	**18.3**	**lbs/day**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 1
1/23/03 - Aeration Run #5 - SC2 Outlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.21	0.4583	109	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
Average =			
0.21	0.4583	108.1	**0.01**
	=	568	degR

mw =	28.51	
stack area =	7.07	
press =	29.90	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	31.7	ft/sec
Flow =	**12101**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0000138**	**lbs/min**
EtO Mass Flow =	**0.000830**	**lbs/hr**
EtO Mass Flow =	**0.0199**	**lbs/day**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 1
1/23/03 - Aeration Run #6 - SC2 Inlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.21	0.4583	108	9.69
0.21	0.4583	108	9.63
0.21	0.4583	108	9.55
0.21	0.4583	108	9.69
0.21	0.4583	108	9.65
0.21	0.4583	108	9.61
0.21	0.4583	107	9.51
0.21	0.4583	108	9.58
0.21	0.4583	108	9.89
0.21	0.4583	108	9.27
0.21	0.4583	108	9.33
0.21	0.4583	108	9.27
Average =			
0.21	0.4583	107.9	**9.56**
	=	568	degR

mw =	28.51	
stack area =	7.07	
press =	29.90	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	31.7	ft/sec
Flow =	**12102**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0132209**	**lbs/min**
EtO Mass Flow =	**0.793**	**lbs/hr**
EtO Mass Flow =	**19.0**	**lbs/day**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

IBA/Griffith Micro Science - Willowbrook, Illinois - Plant 1
1/23/03 - Aeration Run #6 - SC2 Outlet

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	107	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
0.21	0.4583	108	0.01
Average =			
0.21	0.4583	107.9	**0.01**
	=	568	degR

mw =	28.51	
stack area =	7.07	
press =	29.90	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	31.7	ft/sec
Flow =	**12102**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0000138**	**lbs/min**
EtO Mass Flow =	**0.000830**	**lbs/hr**
EtO Mass Flow =	**0.0199**	**lbs/day**

ETHYLENE OXIDE SOURCE TEST/CALIBRATION DATA

Client: IBA/Griffith-Willowbrook 1 Job No: 9912090

Source Tested: AAT Safe Cell System Date: 1/23/03

PRE CALIBRATION

Outlet (PID)	Calibration Gas Conc. (ppmv)	0.811 EtO	7.84 EtO	103 EtO			10 HCFC22	100 HCFC22	1000 HCFC22
	Area Counts #1	2.76	25.8	332					
	Area Counts #2	2.78	25.6	333					
	Average Area	2.77	25.7	333					
	Audit Standard (50.3 ppmv) Result					52.0			
Inlet (FID)	Calibration Gas Conc. (ppmv)	0.811 EtO	7.84 EtO	103 EtO	1010 EtO	~~10400~~ EtO	10 HCFC124	100 HCFC124	1000 HCFC124
	Area Counts #1	2.20	21.8	284					
	Area Counts #2	2.30	21.7	287					
	Average Area	2.28	21.8	286					
	Audit Standard (50.3 ppmv) Result					51.2			

	Run #1	Run #2	Run #3				
/SC2 Aeration ~~Exhaust~~ Start/Stop:	1610/1710	710/810	1810/1910	P_{bar}:	29.90	EtO Usage (lbs/yr):	—
2 only Aeration Start/Stop:	1950/2050	2050/2150	2150/2250	%H_2O:	3% max	Cycles Per Week:	—

POST CALIBRATION

Outlet (PID)	Calibration Gas Conc. (ppmv)	0.811 EtO	7.84 EtO	103 EtO			10 HCFC22	100 HCFC22	1000 HCFC22
	Area Counts #1								
	Area Counts #2								
	Average Area								
	Audit Standard (50.3 ppmv) Result					50.2			
Inlet (FID)	Calibration Gas Conc. (ppmv)	0.811 EtO	7.84 EtO	103 EtO	1010 EtO	10400 EtO	10 HCFC124	100 HCFC124	1000 HCFC124
	Area Counts #1								
	Area Counts #2								
	Average Area								
	Audit Standard (50.3 ppmv) Result					49.3			

KES

KREMER ENVIRONMENTAL SERVICES - VELOCITY TRAVERSE DATA

Client: IBA/Griffith MicroScience Run #: 1 Date: 1/23/03 Port Sketch:

Location: Willowbrook, Illinois - Plant I Probe Type: S-type Baro Press: 29.90

Source: Ethylene Oxide Emission Control System Inlet Stack I.D.: 36 in. Static Press: -0.01

	Port 1							Port 2						
Inches From Port	Point#	Delta P Low	Delta P High	Delta P Average	Delta P Sq Root	Stack Temp (F)	Cyclonic Angle	Point#	Delta P Low	Delta P High	Delta P Average	Delta P Sq Root	Stack Temp (F)	Cyclonic Angle
0.76	1	0.18	0.19	0.185	0.4301	106	0	1	0.18	0.19	0.185	0.4301	106	0
2.4	2	0.19	0.2	0.195	0.4416	106	0	2	0.19	0.2	0.195	0.4416	106	0
4.3	3	0.2	0.2	0.2	0.4472	106	5	3	0.2	0.21	0.205	0.4528	107	0
6.4	4	0.2	0.21	0.205	0.4528	106	5	4	0.21	0.22	0.215	0.4637	107	5
9	5	0.2	0.22	0.21	0.4583	107	5	5	0.22	0.23	0.225	0.4743	107	5
12.8	6	0.23	0.24	0.235	0.4848	107	5	6	0.23	0.24	0.235	0.4848	107	0
23.2	7	0.23	0.23	0.23	0.4796	107	0	7	0.23	0.23	0.23	0.4796	107	0
27	8	0.21	0.21	0.21	0.4583	107	5	8	0.21	0.22	0.215	0.4637	107	5
29.6	9	0.2	0.21	0.205	0.4528	107	0	9	0.21	0.21	0.21	0.4583	107	5
31.8	10	0.2	0.2	0.2	0.4472	107	0	10	0.2	0.21	0.205	0.4528	107	5
33.6	11	0.19	0.2	0.195	0.4416	107	0	11	0.2	0.2	0.2	0.4472	108	0
35.2	12	0.18	0.19	0.185	0.4301	107	0	12	0.19	0.2	0.195	0.4416	108	0
	13							13						
	14							14						
	15							15						
	16							16						
	17							17						
	18							18						
	19							19						
	20							20						
	21							21						
	22							22						
	23							23						
	24							24						
								Average Values:			0.2071	0.4548	106.8	2.1

ED_002192_00004534-00236

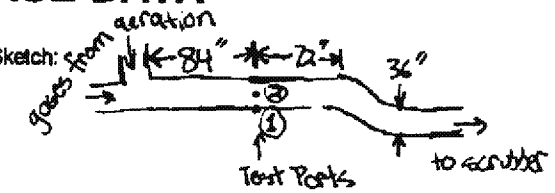
KREMER ENVIRONMENTAL SERVICES - VELOCITY TRAVERSE DATA

Client: IBA/Griffith MicroScience, Inc.
Location: Willowbrook, IL - Plant I
Source: AAT Safe Cell System

Run #: 1
Probe Type: S-type
Stack I.D.: 36"

Date: 1/23/03
Baro Press: 29.90
Static Press: -0.01

Port Sketch:



Port 1								Port 2							
Inches From Port	Point#	Delta P Low	Delta P High	Delta P Average	Delta P Sq Root	Stack Temp (F)	Cyclonic Angle	Point#	Delta P Low	Delta P High	Delta P Average	Delta P Sq Root	Stack Temp (F)	Cyclonic Angle
.76	1	.18	.19			106	0	1	.18	.19			106	0
2.4	2	.19	.2			106	0	2	.19	.2			106	0
4.3	3	.2	.2			106	5	3	.2	.21			107	0
6.4	4	.2	.21			106	5	4	.21	.22			107	5
9	5	.2	.22			107	5	5	.22	.23			107	5
12.8	6	.23	.24			107	5	6	.23	.24			107	0
28.2	7	.23	.23			107	0	7	.23	.23			107	0
27	8	.21	.21			107	5	8	.21	.22			107	5
29.6	9	.2	.21			107	0	9	.21	.21			107	5
31.8	10	.2	.2			107	0	10	.2	.21			107	5
33.6	11	.19	.2			107	0	11	.2	.2			108	0
35.2	12	.18	.19			107	0	12	.19	.2			106	0
	13							13						
	14							14						
	15							15						
	16							16						
	17							17						
	18							18						
	19							19						
	20							20						
	21							21						
	22							22						
	23							23						
	24							24						
								Average Values:						

ED_002192_00004534-00237

ETHYLENE OXIDE SOURCE TEST/CALIBRATION DATA

Client: IBA/Griffith-Willowbrook 2 Job No: 992090

Source Tested: AAI Safe Cell System Date: 1/24/03

PRE CALIBRATION

Outlet (PID)	Calibration Gas Conc. (ppmv)	0.811 EtO	7.84 EtO	103 EtO			10 HCFC22	100 HCFC22	1000 HCFC22
	Area Counts #1	2.24	22.8	302					
	Area Counts #2	2.16	22.5	303					
	Average Area	2.20	22.7	303					
	Audit Standard (50.3 ppmv) Result					50.7			
Inlet (FID)	Calibration Gas Conc. (ppmv)	0.811 EtO	7.84 EtO	103 EtO	1010 EtO	10400 EtO	10 HCFC124	100 HCFC124	1000 HCFC124
	Area Counts #1	1.87	18.0	253					
	Area Counts #2	1.84	18.4	255					
	Average Area	1.86	18.2	254					
	Audit Standard (50.3 ppmv) Result					50.3			

	Run #1	Run #2	Run #3				
~~Exhaust~~ ks2 Aeration Start:	1240/1340	1357/1457	1502/1602	P_{bar}:	29.94	EtO Usage (lbs/yr):	—
Aeration Start:	1240/1340	1357/1457	1502/1602	$\%H_2O$:	3	Cycles Per Week:	—

POST CALIBRATION

Outlet (PID)	Calibration Gas Conc. (ppmv)	0.811 EtO	7.84 EtO	103 EtO			10 HCFC22	100 HCFC22	1000 HCFC22
	Area Counts #1								
	Area Counts #2								
	Average Area								
	Audit Standard (50.3 ppmv) Result					49.6			
Inlet (FID)	Calibration Gas Conc. (ppmv)	0.811 EtO	7.84 EtO	103 EtO	1010 EtO	10400 EtO	10 HCFC124	100 HCFC124	1000 HCFC124
	Area Counts #1								
	Area Counts #2								
	Average Area								
	Audit Standard (50.3 ppmv) Result					50.1			

KES

KREMER ENVIRONMENTAL SERVICES - VELOCITY TRAVERSE DATA

Client: IBA/Griffith MicroScience Run #: 1 Date: 1/24/03 Port Sketch:

Location: Willowbrook, Illinois - Plant II Probe Type: S-type Baro Press: 29.94

Source: Ethylene Oxide Emission Control System Inlet Stack I.D.: 28 in. Static Press: -0.01

	Port 1							Port 2						
Inches From Port	Point#	Delta P Low	Delta P High	Delta P Average	Delta P Sq Root	Stack Temp (F)	Cyclonic Angle	Point#	Delta P Low	Delta P High	Delta P Average	Delta P Sq Root	Stack Temp (F)	Cyclonic Angle
0.59	1	0.19	0.2	0.195	0.4416	78	0	1	0.19	0.2	0.195	0.4416	79	0
1.9	2	0.2	0.2	0.2	0.4472	78	5	2	0.2	0.21	0.205	0.4528	79	0
3.3	3	0.2	0.21	0.205	0.4528	79	5	3	0.21	0.21	0.21	0.4583	79	0
5.0	4	0.22	0.22	0.22	0.4690	79	10	4	0.22	0.21	0.215	0.4637	79	5
7.0	5	0.23	0.23	0.23	0.4796	79	5	5	0.23	0.23	0.23	0.4796	79	5
10.0	6	0.24	0.25	0.245	0.4950	79	5	6	0.24	0.25	0.245	0.4950	79	0
18.0	7	0.25	0.25	0.25	0.5000	79	5	7	0.24	0.25	0.245	0.4950	79	0
21.0	8	0.24	0.25	0.245	0.4950	79	5	8	0.24	0.24	0.24	0.4899	79	5
23.0	9	0.23	0.24	0.235	0.4848	79	5	9	0.23	0.24	0.235	0.4848	79	5
24.7	10	0.22	0.23	0.225	0.4743	79	5	10	0.22	0.23	0.225	0.4743	80	5
26.1	11	0.21	0.22	0.215	0.4637	79	0	11	0.21	0.22	0.215	0.4637	80	0
27.4	12	0.2	0.2	0.2	0.4472	80	0	12	0.2	0.21	0.205	0.4528	80	0
	13							13						
	14							14						
	15							15						
	16							16						
	17							17						
	18							18						
	19							19						
	20							20						
	21							21						
	22							22						
	23							23						
	24							24						
								Average Values:			0.2221	0.4709	79.1	3.1

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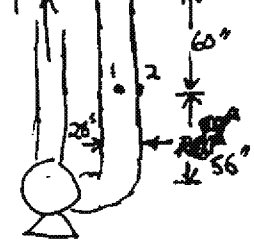
KREMER ENVIRONMENTAL SERVICES - VELOCITY TRAVERSE DATA

Client: IBA/Griffith - Willowbrook II
Location: AAT Safe cell System Outlet
Source:

Run #: 1
Date: 1/24/03
Probe Type: S-type
Stack I.D.: 28"
Baro Press: 29.94
Static Press: -0.01

Port Sketch:



Inches From Port	Port 1 Point#	Delta P Low	Delta P High	Delta P Average	Delta P Sq Root	Stack Temp (F)	Cyclonic Angle	Port 2 Point#	Delta P Low	Delta P High	Delta P Average	Delta P Sq Root	Stack Temp (F)	Cyclonic Angle
.59	1	.19	.2			78	0	1	.19	.2			79	0
1.9	2	.2	.2			78	5	2	.2	.21			79	0
3.3	3	.2	.21			79	5	3	.21	.21			79	0
5	4	.22	.22			79	10	4	.21	.22			79	5
7	5	.23	.23			79	5	5	.23	.23			79	5
10	6	.24	.25			79	5	6	.24	.25			79	0
16	7	.25	.25			79	5	7	.24	.25			79	0
21	8	.24	.25			79	5	8	.24	.24			79	5
23	9	.23	.24			79	5	9	.23	.24			79	5
24.7	10	.22	.23			79	5	10	.22	.23			80	5
26.1	11	.21	.22			79	0	11	.21	.22			80	0
27.4	12	.2	.2			80	0	12	.2	.21			80	0
	13							13						
	14							14						
	15							15						
	16							16						
	17							17						
	18							18						
	19							19						
	20							20						
	21							21						
	22							22						
	23							23						
	24							24						
								Average Values:						

ED_002192_00004534-00240

APPENDIX O

Facility Monitoring Data

PERFORMANCE TEST RESULTS
FOR WILLOWBROOK I & II

The following are the results of bag testing conducted January 23, 2003 at IBA's Willowbrook, Illinois facilities. Testing was conducted according to the protocol dated January 14, 2003 and submitted to both Illinois Environmental Protection Agency and US Environmental Protection Agency-Region V.

Equipment used for testing: Facility___Willowbrook I.

Aeration Tests	Foxboro 128 FID	OVA TVA-1000B	Baseline GC 8550 PID	Perkin Elmer 5216 FID Monitor	Kremer Environmental Results
Test One: Inlet	*	*	7.90 ppm	5.32 ppm	7.94 ppm
Test One: Outlet	*	*	2.16 ppm	2.45 ppm	1.09 ppm
Test Two: Inlet	*	*	7.92 ppm	Insufficient Gas for test.	7.95 ppm
Test Two: Outlet	*	*	2.21 ppm	0.75 ppm	0.73 ppm
Test Three: Inlet	*	*	9.00 ppm	Insufficient Gas for Test.	7.83 ppm
Test Three: Outlet	*	*	0.50 ppm	2.79 ppm	0.80 ppm

* All results over 3 ppm.

Sampling conducted by___Stephen Morris and Roger Clark_ 1/23/03_____.

ED_002192_00004534-00242

PERFORMANCE TEST RESULTS
FOR WILLOWBROOK I & II

The following are the results of bag testing conducted January 24, 2003 at IBA's Willowbrook, Illinois facilities. Testing was conducted according to the protocol dated January 14, 2003 and submitted to both Illinois Environmental Protection Agency and US Environmental Protection Agency-Region V.

Equipment used for testing: Facility___Willowbrook II.

Aeration Tests	Foxboro 128 FID	OVA TVA-1000B	Baseline GC 8550 PID	Perkin Elmer 5216 FID Monitor	Kremer Environmental Results
Test One: Inlet	*	*	2.10 ppm	1.76 ppm	1.31 ppm
Test One: Outlet	*	*	3.70 ppm	4.42 ppm	0.53 ppm
Test Two: Inlet	*	*	2.10 ppm	1.85 ppm	1.61 ppm
Test Two: Outlet	*	*	0.767 ppm	1.69 ppm	0.65 ppm
Test Three: Inlet	*	*	2.15 ppm	1.69 ppm	1.86 ppm
Test Three: Outlet	*	*	0.764 ppm	4.53 ppm	0.43 ppm

* Unit was not used for the second test.

Sampling conducted by___Stephen Morris and Roger Clark_ 1/24/03_____.
Date

ED_002192_00004534-00243

APPENDIX P

Calibration Gas Certificates

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (909) 653-6780 • FAX (909) 653-2430

REPORT OF ANALYSIS

KRES01
TO: Dan Kremer
Kremer Environmental Service
28151 San Lucas
Mission Viejo CA 92692-1313

DATE: OCT 01 2002

CUSTOMER ORDER NUMBER: Vbl/D Kremer

CYLINDER NUMBER : FF21263

COMPONENT	CONCENTRATION(v/v)
Ethylene Oxide	0.811 ± 0.041 ppm
Nitrogen	Balance @ 1300 psig

Reanalysis
ppm = µmole/mole % = mole-%

ANALYST M.S. Calhoun APPROVED J.T. Marrin

The only liability of this company for gas which fails to comply with this analysis shall be replacement or reanalysis thereof by the company without extra cost.

STANDARD CALIBRATION GASES IN ALUMINUM CYLINDERS

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (909) 653-6780 • FAX (909) 653-2430

REPORT OF ANALYSIS

KRES01
TO: Dan Kremer
Kremer Environmental Service
28151 San Lucas
Mission Viejo CA 92692-1313

DATE: OCT 03 2002

CUSTOMER ORDER NUMBER: Vbl/D Kremer

CYLINDER NUMBER : FF13060

COMPONENT	CONCENTRATION(v/v)
Ethylene Oxide	7.84 ± 0.08 ppm
Nitrogen	Balance @ 400 psig

Reanalysis
ppm = µmole/mole % = mole-%

ANALYST M.S. Calhoun APPROVED J.T. Marrin

The only liability of this company for gas which fails to comply with this analysis shall be replacement or reanalysis thereof by the company without extra cost.

STANDARD CALIBRATION GASES IN ALUMINUM CYLINDERS

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (909) 653-6780 • FAX (909) 653-2430

REPORT OF ANALYSIS

KRES01
TO: Dan Kremer
Kremer Environmental Service
28151 San Lucas
Mission Viejo CA 92692-1313

DATE: OCT 0 1 2002

CUSTOMER ORDER NUMBER: Vbl/D Kremer

CYLINDER NUMBER : FF35828

COMPONENT	CONCENTRATION(v/v)
Ethylene Oxide	102.7 ± 1.0 ppm
Nitrogen	Balance @ 400 psig

Reanalysis
ppm = µmole/mole % = mole-%

ANALYST M.S. Calhoun APPROVED J.T. Marrin

The only liability of this company for gas which fails to comply with this analysis shall be replacement or reanalysis thereof by the company without extra cost.

STANDARD CALIBRATION GASES IN ALUMINUM CYLINDERS

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (909) 653-6780 • FAX (909) 653-2430

REPORT OF ANALYSIS

KRES01
TO: Dan Kremer
Kremer Environmental Service
28151 San Lucas
Mission Viejo CA 92692-1313

DATE: JUL 01 2002

CUSTOMER ORDER NUMBER: Vbl/D Kremer

CYLINDER NUMBER : FF36946

COMPONENT	CONCENTRATION(v/v)
Ethylene Oxide	1011 ± 10 ppm
Nitrogen	Balance @ 500 psig

Reanalysis
ppm = µmole/mole % = mole-%

ANALYST M.S. Calhoun APPROVED U.T. Marrin

The only liability of this company for gas which fails to comply with this analysis shall be replacement or reanalysis thereof by the company without extra cost.

STANDARD CALIBRATION GASES IN ALUMINUM CYLINDERS

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (909) 653-6780 • FAX (909) 653-2430

REPORT OF ANALYSIS

KRES01
TO: Dan Kremer
Kremer Environmental Service
28151 San Lucas
Mission Viejo CA 92692-1313

DATE: OCT 3 2002

CUSTOMER ORDER NUMBER: Vbl/D Kremer

CYLINDER NUMBER : FF38679

COMPONENT	CONCENTRATION(v/v)
Ethylene Oxide	10390 ± 104 ppm
Nitrogen	Balance @ 500 psig

Reanalysis
ppm = µmole/mole % = mole-%

ANALYST M.S. Calhoun APPROVED J.T. Marrin

The only liability of this company for gas which fails to comply with this analysis shall be replacement or reanalysis thereof by the company without extra cost.

STANDARD CALIBRATION GASES IN ALUMINUM CYLINDERS

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS

CUSTOMER KREMER ENVIRONMENTAL

DATE 10/17/00

P.O NUMBER

REF. NUMBER 70092700

REQUESTED COMPOSITION

GAS	CONCENTRATION
ETHYLENE OXIDE	50 ppm
NITROGEN	BALANCE
ANALYTICAL ACCURACY	±2 %

ANALYTICAL METHOD

INSTRUMENT	ANALYTICAL PRINCIPLE
HP 5890 Series II+ S/N 3310A48533	G.C. / Flame Ionization

VALUES NOT VALID BELOW 150 PSIG.

THIS CYLINDER NO.	FF 16484
CYLINDER PRESSURE	2000 PSIG
EXPIRATION DATE	12-31-03
CLASSIFICATION	CERTIFIED STANDARD
BATCH NUMBER	N/A
LOT NUMBER	109028301
PART NUMBER	NI E050MC-A3
CYLINDER SIZE	A3 CGA 350 29 CFT

CERTIFIED CONCENTRATION

ETHYLENE OXIDE	50.3 ppm
NITROGEN	BALANCE
ANALYTICAL ACCURACY	±2 %

ANALYZED BY PHU TIEN NGUYEN

CERTIFIED BY JOSEPH CHARLES

PORTANT
rmation contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the rmation for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the ility of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

cc'd: KM 7-26-05
ETR
6-21-05

ATI
Orange
043110 AAC

REPORT OF
AIR POLLUTION SOURCE TESTING
OF AN ETHYLENE OXIDE EMISSION-CONTROL SYSTEM
OPERATED BY STERIGENICS EO, INC.
IN WILLOWBROOK, ILLINOIS
ON JUNE 21, 2005

Submitted to:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
Air Pollution Control Division
1021 North Grand Avenue East, Mail-drop 39
Springfield, Illinois 62794-9276

RECEIVED
JUL 22 2005
Environmental Protection Agency
Bureau of Air
STATE OF ILLINOIS

Submitted by:

STERIGENICS EO, INC.
7775 South Quincy Street
Willowbrook, Illinois 60521

I.D. Number 043110AAC

Prepared by:

KREMER ENVIRONMENTAL SERVICES, INC.
911 Avenida Salvador
San Clemente, California 92672-2324

EPA-DIVISION OF RECORDS MANAGEMENT
RELEASABLE
NOV 26 2012
REVIEWER RDH

July 12, 2005

KES

1.0 INTRODUCTION

On Tuesday, June 21, 2005, Kremer Environmental Services, Inc. performed air pollution source testing of an ethylene oxide (EtO) emission-control system operated by Sterigenics EO, Inc. at their Willowbrook 1 Plant in Willowbrook, Illinois. The emission-control device tested is a two-stage Advanced Air Technologies Safe Cell emission-control system (AAT System), comprised of a packed-tower chemical scrubber and a dry-bed reactor, which is currently used to control emissions from fourteen EtO sterilizer backvents, four aeration cells, and three aeration rooms.

In accordance with the conditions established in the Air Quality Permit granted to Sterigenics EO by the Illinois Environmental Protection Agency (IEPA), the AAT System is only used to control emissions from the fourteen EtO sterilizer vacuum pumps when the existing Chemrox DEOXX packed-tower scrubber is inoperable. The AAT System was tested with sterilizer vacuum pump emissions to certify it as a backup emission-control system.

The purpose of the testing program was to evaluate compliance with EPA requirements under the current National Emissions Standards for Hazardous Air Pollutants (NESHAP), and with the conditions established in the Air Quality Permit granted to Sterigenics EO by the IEPA, Air Pollution Control Division.

2.0 EQUIPMENT

The EtO gas-sterilization system is comprised of fourteen commercial sterilizers which, during normal operations, all discharge through liquid-ring vacuum pumps to an existing Chemrox DEOXX packed-tower scrubber system. Currently, all aeration vents and chamber exhaust vents (backvents) are discharged to an existing two-stage Advanced Air Technologies (AAT) Safe Cell emission-control system, which can also be used to control sterilizer vacuum pump emissions. The gas-sterilization and emission-control equipment consists of the following:

- Fourteen Gas Sterilizers, each comprised of a steam-heated sterilization chamber, a recirculating vacuum pump chamber evacuation system ("chamber vacuum vent"), a backdraft valve ("chamber exhaust vent"), and a fugitive emissions exhaust hood;

- Four aeration cells and three aeration rooms, each comprised of a heated aeration chamber and a chamber exhaust system

Backvent and aeration cell/room emissions are controlled by, and sterilizer vacuum pump emissions can be controlled by:

- One two-stage Advanced Air Technologies Safe Cell emission-control system, comprised of a packed-tower chemical scrubber, equipped with a packed reaction/interface column, a scrubber fluid recirculation system, and a scrubber fluid reaction/storage tank, and a dry bed reactor/scrubber, comprised of a bank of solid-bed reaction vessels, connected in parallel, installed downstream of the packed-tower scrubber and upstream of a dedicated blower exhaust system.

During normal operations, sterilizer vacuum pump emissions are controlled by:

- One Chemrox DEOXX packed tower chemical scrubber, equipped with a packed reaction/interface column, a scrubber fluid recirculation system, and a scrubber fluid reaction/storage tank.

3.0 TESTING

EtO source testing was performed in accordance with the procedures outlined in USEPA CFR40, Part 63.365. EtO emissions monitoring was performed simultaneously at the inlet and outlet of the AAT system during the first chamber evacuation of the sterilizer exhaust phase and during the entire duration of the backvent phase of one of the larger sterilizers. A total of three exhaust-phase and three backvent test runs were performed.

Exhaust phase testing with one sterilizer discharging to the AAT system at a time represents worst-case conditions for demonstration of control efficiency compliance. At this lower inlet loading, the AAT system must perform at its maximum efficiency to achieve outlet EtO concentrations low enough to demonstrate compliance. Also, due to the batch nature of normal sterilization operations, it is virtually impossible for multiple chambers to simultaneously be in the first chamber evacuation of the sterilizer exhaust phase.

During the first chamber evacuation of the exhaust phase, sterilizer vacuum pump emissions to the inlet of the AAT system were determined using the Ideal Gas Law and the chamber conditions at the beginning and at the end of the first chamber evacuation. Inlet EtO emissions from the 24-hour/day aeration process were determined using direct source sample injection into the GC, and were added to the total EtO emissions to the inlet of the AAT system. During the first chamber evacuation of the exhaust phase, total EtO emissions from the outlet of the AAT system were determined using direct source sample injection into the GC. During the backvent phase, EtO emissions from the inlet and outlet of the AAT system were also determined using direct source sample injection into the GC.

All exhaust and backvent phase testing was conducted during normal process load conditions, with freshly sterilized product present in the sterilization chamber, but exhaust phase testing was performed with an empty sterilization chamber to facilitate the completion of multiple test runs. The testing program was conducted in accordance with the procedures outlined in the following sections.

4.0 RULE/COMPLIANCE REQUIREMENTS

The EtO gas-sterilization system at Sterigenics EO, Inc. was tested to determine compliance with the current federal EPA National Emissions Standard for Hazardous Air Pollutants (NESHAP) for ethylene oxide, and with the requirements specified in the Illinois EPA Permit. The current testing was performed to demonstrate compliance with the following requirements:

- The emissions from the sterilization chamber vacuum vent (exhaust) and from the sterilization chamber exhaust vent (backvent) must be discharged to control equipment. The control efficiency for the sterilization chamber vacuum vent (exhaust) must be at least 99.0% by weight; the sterilization chamber exhaust vent (backvent) must be at least 81% by weight pursuant to 35 IAC 218.302.

Testing is required to demonstrate compliance with these requirements. Source testing of the emission-control device is required initially, and may be required periodically thereafter.

5.0 TEST METHOD REFERENCE

5.1 INTRODUCTION

EtO source testing was performed in accordance with the procedures outlined in USEPA CFR40, Part 63.365. EtO emissions monitoring was performed simultaneously at the inlet and outlet of the AAT system during the first chamber evacuation of the sterilizer exhaust phase and during the entire duration of the backvent phase of one of the larger sterilizers. A total of three exhaust-phase and three backvent test runs were performed.

Exhaust phase testing with one sterilizer discharging to the AAT system at a time represents worst-case conditions for demonstration of control efficiency compliance. At this lower inlet loading, the AAT system must perform at its maximum efficiency to achieve outlet EtO concentrations low enough to demonstrate compliance. Also, due to the batch nature of normal sterilization operations, it is virtually impossible for multiple chambers to simultaneously be in the first chamber evacuation of the sterilizer exhaust phase.

During the first chamber evacuation of the exhaust phase, sterilizer vacuum pump emissions to the inlet of the AAT system were determined using the Ideal Gas Law and the chamber conditions at the beginning and at the end of the first chamber evacuation. Inlet EtO emissions from the 24-hour/day aeration process were determined using direct source sample injection into the GC, and were added to the total EtO emissions to the inlet of the AAT system. During the first chamber evacuation of the exhaust phase, total EtO emissions from the outlet of the AAT system were determined using direct source sample injection into the GC. During the backvent phase, EtO emissions from the inlet and outlet of the AAT system were also determined using direct source sample injection into the GC.

All exhaust and backvent phase testing was conducted during normal process load conditions, with freshly sterilized product present in the sterilization chamber, but exhaust phase testing was performed with an empty sterilization chamber to facilitate the completion of multiple test runs.

Operation and documentation of process conditions were performed by personnel from Sterigenics EO, Inc. using existing monitoring instruments installed by the manufacturer on the equipment to be tested. In

accordance with the procedures established in USEPA CFR40, Part 63, Subpart O, scrubber liquor level was recorded. Results of this monitoring are attached as Appendix K.

5.2 VOLUMETRIC FLOW MEASUREMENT

Exhaust gas flow at the outlet of the scrubber was determined by EPA Method 2C using a standard pitot tube and an inclined-oil manometer. Sampling ports were located far enough from any flow disturbances to permit accurate flow measurement.

Temperature measurements were obtained from a type K thermocouple and thermometer attached to the sampling probe. Exhaust gas composition, was assumed to be air and small amounts of water vapor. Water vapor was negligible, at about 3 percent.

5.3 CONTROL EFFICIENCY AND MASS EMISSIONS MEASUREMENT

During the first chamber evacuation of the sterilizer exhaust phase, the sterilizer vacuum pump emissions discharged to the inlet of the scrubber were determined using the procedures outlined in CFR40, Part 63.365. This method allows the determination of the mass of EtO discharged by the sterilizer vacuum pump to the inlet of the scrubber through calculations based on the Ideal Gas Law and using the conditions (pressure, temperature, volume) of the sterilization chamber immediately after it has been charged with sterilant gas, and upon conclusion of the first chamber evacuation of the exhaust phase.

The mass of EtO discharged to the inlet of the scrubber by the sterilizer vacuum pump during the first chamber evacuation of the exhaust phase was determined by calculating the mass of EtO present in the chamber after the first chamber evacuation and subtracting it from the mass of EtO present in the chamber after it has been charged with sterilant gas. The mass of EtO present in the chamber was calculated using Equation 1, shown below in Section 5.9.

During the sterilizer vacuum pump emissions testing, inlet EtO emissions from the 24-hour/day aeration process were determined using direct source sample injection into the GC. The total mass of EtO discharged to the inlet of the AAT system was determined by adding the inlet emissions from the aeration process to the inlet emissions from the sterilizer vacuum pumps.

During the first chamber evacuation of the sterilizer exhaust phase, total EtO emissions from the outlet were determined using direct source sample injection into the GC. During the backvent phase, EtO emissions at the inlet and outlet of the AAT system were also determined using direct source sample injection into the GC. The mass of EtO emitted was determined using Equation 2, shown below in Section 5.9. Mass-mass control-efficiency of EtO during the sterilizer exhaust and backvent phases was calculated by comparing the mass of EtO vented to the system inlet to the mass of EtO vented from the system outlet.

During the sterilizer exhaust and backvent phases, vented gas was analyzed by an SRI, Model 8610, portable gas chromatograph (GC), equipped with the following: dual, heated sample loops and injectors; dual columns; and dual detectors. A flame ionization detector (FID) was used to quantify EtO emissions at the AAT system inlet, and a photoionization detector (PID) was used to quantify low-level EtO emissions at the AAT system outlet.

5.4 SAMPLE TRANSPORT

Source gas was pumped to the GC at 500-1000 cubic centimeters per minute (cc/min) from the sampling ports through two lengths of Teflon® sample line, each with a nominal interior volume of approximately 75 cubic centimeters (cc) and an outer diameter of 0.25 inch. At the inlet of the AAT System, the sampling port was located downstream of dilution air, in the ducting upstream of the location where the sterilizer vacuum pump emissions are discharged into the AAT system. At the outlet of the AAT System, sampling ports were located in the exhaust ducting, downstream of the dry bed reactor.

5.5 GC INJECTION

Source-gas samples were then injected into the GC which was equipped with two heated sampling loops, each containing a volume of approximately 2cc and maintained at 100 degrees Celsius (C). Injections occurred at approximately two minute intervals during the exhaust and back vent phases. Helium was the carrier gas for both the FID and PID.

5.6 GC CONDITIONS

The packed columns for the GC were both operated at 75 degrees C. The columns were stainless steel, 6 feet long, 0.125 inch outer diameter, packed with 1 percent SP-1000 on 60/80 mesh Carbopack B.

During the analysis, the FID was operated at 250 degrees C. The support gases for the FID were hydrogen (99.995% pure) and air (99.9999% pure). Any unused sample gas was vented from the GC system back to the inlet of the scrubber.

5.7 CALIBRATION STANDARDS

The FID was calibrated for part-per-million-by-volume (ppmv) level analyses using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

The PID was calibrated for ppmv level analyses using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

Each of these calibration standards was in a separate, certified manufacturer's cylinder. Copies of the calibration gas laboratory certificates are attached as Appendix I.

5.8 SAMPLING DURATION

Exhaust phase EtO measurements were performed for the entire duration of the first chamber evacuation, which was approximately 20 minutes long. This encompassed a total sampling duration of approximately 20 minutes for each exhaust phase test run. Backvent phase EtO measurements were performed for the 15-minute duration of the backvent phase.

5.9 CONTROL-EFFICIENCY/MASS-EMISSIONS CALCULATIONS

The following equation was used to calculate mass of EtO discharged to the inlet of the AAT system during the first chamber evacuation of the sterilizer exhaust phase:

EQUATION 1:

$W_c = W_{ci} - W_{cf}$

Where:

W_c = Weight of EtO discharged from the sterilization chamber to the emission-control system during the first chamber evacuation, pounds

W_{ci} = (mw)(p)(P)(V)/(R)(T)

(and W_{cf})

Where:

W_{ci} = Weight of EtO present in the sterilization chamber before the first chamber evacuation, pounds

W_{cf} = Weight of EtO present in the sterilization chamber after the first chamber evacuation, pounds

MW = Molecular weight of EtO, 44.05 lb/mol

p = Percent of EtO in chamber

= W_s/W_i

Where:

W_s = Scale-measured weight of EtO charged into sterilization chamber

W_i = Calculated weight of EtO charged into sterilization chamber (assuming 100%)

P = Sterilization chamber pressure (after charging/at the end of the 1st evac), psia

V	=	Sterilization chamber volume, ft^3
R	=	Gas constant, 10.73 $psia \cdot ft^3/mol \cdot {}^oR$
T	=	Sterilization chamber temperature (after charging/at the end of the 1st evac), ^oR

Note: Standard conditions are 68°F and 1 atm.

Mass emissions of EtO during the sterilizer exhaust and backvent phases were calculated using the following equation:

EQUATION 2:

MassRate = (VolFlow)(MolWt)(ppmv EtO/10^6)/(MolVol)

Where:

MassRate	=	EtO mass flow rate, pounds per minute
VolFlow	=	Corrected volumetric flow rate, standard cubic feet per minute at 68 degrees F
MolWt	=	44.05 pounds EtO per pound mole
ppmv EtO	=	EtO concentration, parts per million by volume
10^6	=	Conversion factor, ppmv per "cubic foot per cubic foot"
MolVol	=	385.32 cubic feet per pound mole at one atmosphere and 68 degrees F

Note: Standard conditions are 68°F and 1 atm.

Mass-mass control efficiency of EtO was calculated for the sterilizer exhaust and backvent phases. Results of the control-efficiency testing are summarized in Section 8.0 and presented in Table 1.

6.0 TEST SCENARIO

All exhaust and backvent phase testing was conducted during normal process load conditions, with freshly sterilized product present in the sterilization chamber, but exhaust phase testing was performed with an empty sterilization chamber to facilitate the completion of multiple test runs. A total of three exhaust-phase and three backvent test runs were performed. Testing was conducted with an effort to offer minimal disruption to the Sterigenics EO, Inc. production schedule. The testing schedule was as follows:

1) Testing equipment was set up and calibrated.
2) Empty-chamber cycles were started in three of the larger sterilizers. These sterilizers were isolated for test use and designated as the first, second, and third test chambers.
3) Backvent Phase Test Run #1 was conducted. Sampling was performed at the inlet and outlet of the AAT system during the backvent phase of one of the sterilizers upon completion of a production load cycle. During the performance of the test, only the sterilizer used for the test is allowed to discharge to the AAT system.
4) Backvent Phase Test Run #2 was conducted. Sampling was performed at the inlet and outlet of the AAT system during the backvent phase of one of the sterilizers upon completion of a production load cycle. During the performance of the test, only the sterilizer used for the test is allowed to discharge to the AAT system.
5) Backvent Phase Test Run #3 was conducted. Sampling was performed at the inlet and outlet of the AAT system during the backvent phase of one of the sterilizers upon completion of a production load cycle. During the performance of the test, only the sterilizer used for the test is allowed to discharge to the AAT system.
6) Exhaust Phase Test Run #1 was conducted. Sampling was performed at the outlet of the AAT system during the first chamber evacuation of the first test chamber. During the performance of the test, only the sterilizer used for the test was allowed to discharge to the AAT system.
7) Exhaust Phase Test Run #2 was conducted. Sampling was performed at the outlet of the AAT system during the first chamber evacuation of the second test chamber. During the performance of the test, only the sterilizer used for the test was allowed to discharge to the AAT system.

8) Exhaust Phase Test Run #3 was conducted. Sampling was performed at the outlet of the AAT system during the first chamber evacuation of the third test chamber. During the performance of the test, only the sterilizer used for the test was allowed to discharge to the AAT system.
9) Post calibration check was performed. Testing equipment was shut down and packed.

7.0 QA/QC

7.1 FIELD TESTING QUALITY ASSURANCE

At the beginning of the test, the sampling system was leak checked at a vacuum of 15 inches of mercury. The sampling system was considered leak free when the flow indicated by the rotameters fell to zero.

At the beginning of the test, a system blank was analyzed to ensure that the sampling system was free of EtO. Ambient air was introduced at the end of the heated sampling line and drawn through the sampling system line to the GC for analysis. The resulting chromatogram also provided a background level for non-EtO components (i.e. ambient air, carbon dioxide, water vapor) which are present in the source gas stream due to the ambient dilution air which is drawn into the emission-control device, and due to the destruction of EtO by the emission-control device. This chromatogram, designated AMB, is included with the calibration data in Appendix A.

7.2 CALIBRATION PROCEDURES

The GC system was calibrated at the beginning and conclusion of each day's testing. Using the Peaksimple II analytical software, a point-to-point calibration curve was constructed for each detector. A gas cylinder of similar composition as the calibration gases, but certified by a separate supplier, was used to verify calibration gas composition and GC performance.

All calibration gases and support gases used were of the highest purity and quality available. A copy of the laboratory certification for each calibration gas is attached as Appendix I.

8.0 TEST RESULTS

The emission-control system was found to have an average EtO control efficiency of 99.7707 for backvent phase emissions, and 99.5774 percent for chamber vacuum pump emissions. In accordance with federal and state requirements, sterilization chamber vacuum pump emissions must be discharged to control equipment with an EtO emission-reduction efficiency of at least 99 percent by weight, and sterilization chamber exhaust vent emissions must be discharged to control equipment with an EtO emission-reduction efficiency of at least 81 percent by weight. The emission-control system met these requirements.

The test results are summarized in Table 1 and 2. These tables include results for EtO control efficiency of the emission-control system. Chromatograms and chromatographic supporting data are attached as Appendices A through G. Copies of field data and calculation worksheets are attached as Appendix H.

TABLES

CONTACT SUMMARY

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TEST DATE

June 21, 2005

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Bureau of Air
STATE OF ILLINOIS

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TABLE 1
BACKVENT PHASE ETHYLENE OXIDE CONTROL EFFICIENCY OF AN AAT SAFE CELL EMISSION CONTROL SYSTEM OPERATED BY STERIGENICS EO, INC. IN WILLOWBROOK, ILLINOIS ON JUNE 21, 2005

RUN NUMBER	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
1(3)	835	77.0	0.20	99.7403
1	836	97.5	0.49	99.4974
1	837	86.8	1.17	98.6521
1	838	85.2	0.40	99.5305
1	840	86.9	0.01	99.9885
1	841	83.3	0.28	99.6639
1	842	83.3	0.01	99.9880
1	844	83.9	0.41	99.5113
1	845	82.2	0.09	99.8905
1	847	80.7	0.01	99.9876
1	848	78.7	0.03	99.9619
TIME-WEIGHTED AVERAGE:		**84.14**	**0.2818**	**99.6738**
2(4)	909	72.4	0.21	99.7099
2	910	84.8	0.19	99.7759
2	911	78.9	0.01	99.9873
2	912	79.8	0.01	99.9875
2	914	80.0	0.01	99.9875
2	915	81.2	0.01	99.9877
2	917	79.5	0.18	99.7736
2	918	81.3	0.08	99.9016
2	920	80.9	0.01	99.9876
2	921	76.5	0.24	99.6863
2	923	77.5	0.33	99.5742
TIME-WEIGHTED AVERAGE:		**79.35**	**0.1164**	**99.8508**
3(5)	949	338	0.27	99.9201
3	950	92.9	0.17	99.8170
3	951	84.4	0.01	99.9882
3	952	81.1	0.01	99.9877
3	954	80.3	0.33	99.5890
3	955	78.3	0.19	99.7573
3	957	79.1	0.21	99.7345
3	958	79.7	0.01	99.9875
3	1000	78.8	0.19	99.7589
3	1001	78.1	0.47	99.3982
3	1003	79.2	0.22	99.7222
TIME-WEIGHTED AVERAGE:		**104.5**	**0.1891**	**99.7873**
			AVERAGE CONTROL EFFICIENCY:	**99.7707**
			REQUIRED CONTROL EFFICIENCY:	**81%**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
(3) - Backvent Run #1 started at 08:34, ended at 08:49.
(4) - Backvent Run #2 started at 09:08, ended at 09:23.
(5) - Backvent Run #3 started at 09:48, ended at 10:03.

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TABLE 2
EXHAUST PHASE ETHYLENE OXIDE CONTROL EFFICIENCY
OF AN AAT SAFE CELL EMISSION CONTROL SYSTEM
OPERATED BY STERIGENICS EO, INC.
IN WILLOWBROOK, ILLINOIS
JUNE 21, 2005

Run #	Stack Flow (dscfm) (2)	Average Outlet Conc. (ppm) (1)	Outlet EtO Mass Flow (lbs/min) (3)	Minutes/ Cycle	Outlet EtO Mass Emissions (lbs)	Inlet EtO Mass Emissions (lbs)	EtO Control Efficiency (%)
#1	10880	8.553	0.0106375	22	0.23402	60.137	99.6108
#2	10810	9.689	0.0119726	20	0.23945	56.520	99.5763
#3	10760	10.08	0.0123985	22	0.27277	59.957	99.5451
						Average EtO Control Efficiency:	**99.5774**
						Required EtO Control Efficiency:	**99**

Notes: (1) - PPM = parts per million by volume
(2) - DSCFM = dry standard cubic feet per minute
(3) - LBS/MIN = EtO emissions, pounds per minute

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APPENDICES

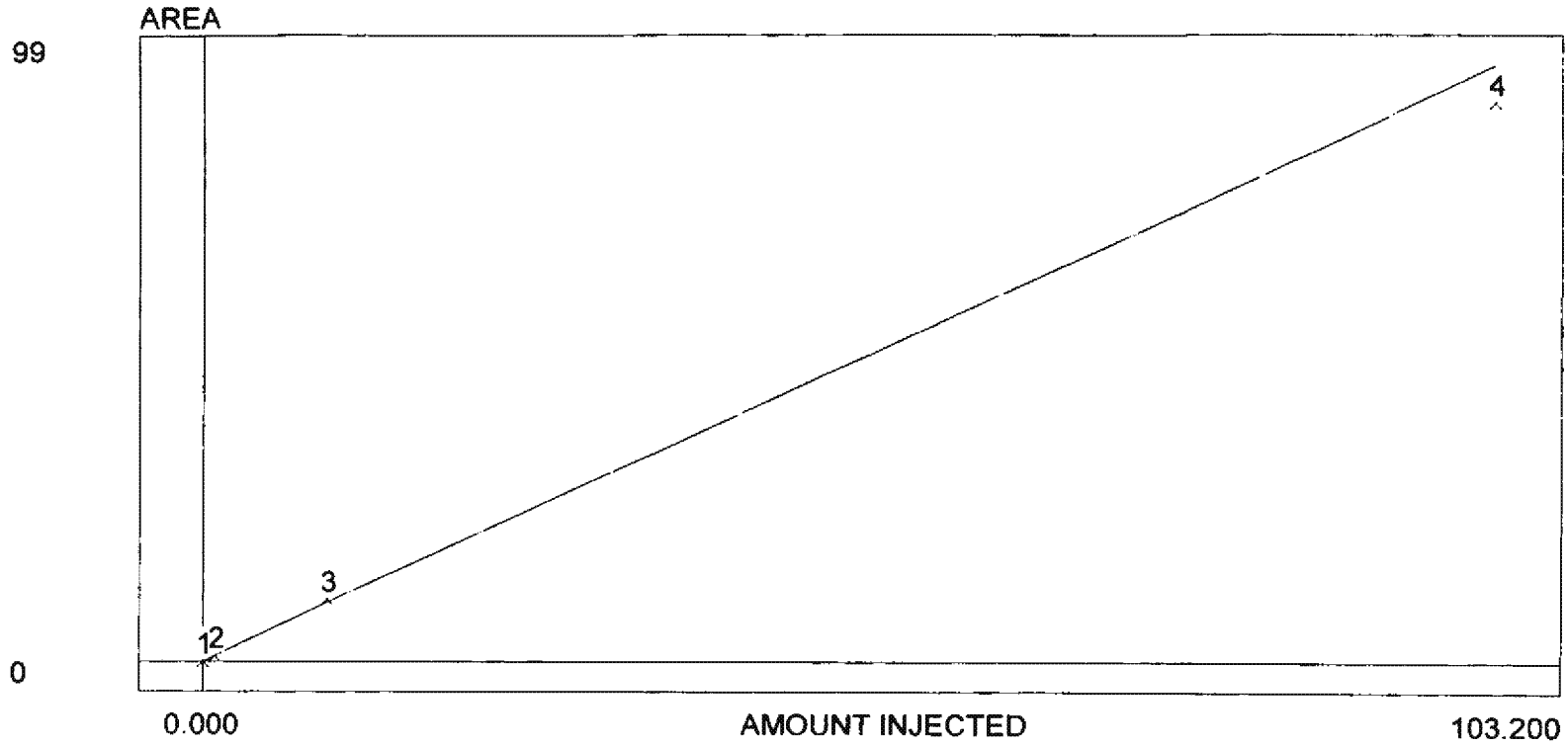
APPENDIX A

Calibration Data

Component file: ETO1-100.CPT

Peak	Name	Start	End	Calibration	Int.Std	Units
1	Dead Vol / Air	0.000	0.350		0.000	
2	Ambient H2O	0.350	0.600		0.000	
3	Ethylene Oxide	0.600	0.700	1SterigenicsWB.c	0.000	ppm
4	Acetaldehyde	0.700	0.800		0.000	
5	CO2	0.800	1.000		0.000	

Calibration file: 1SterigenicsWB.cal



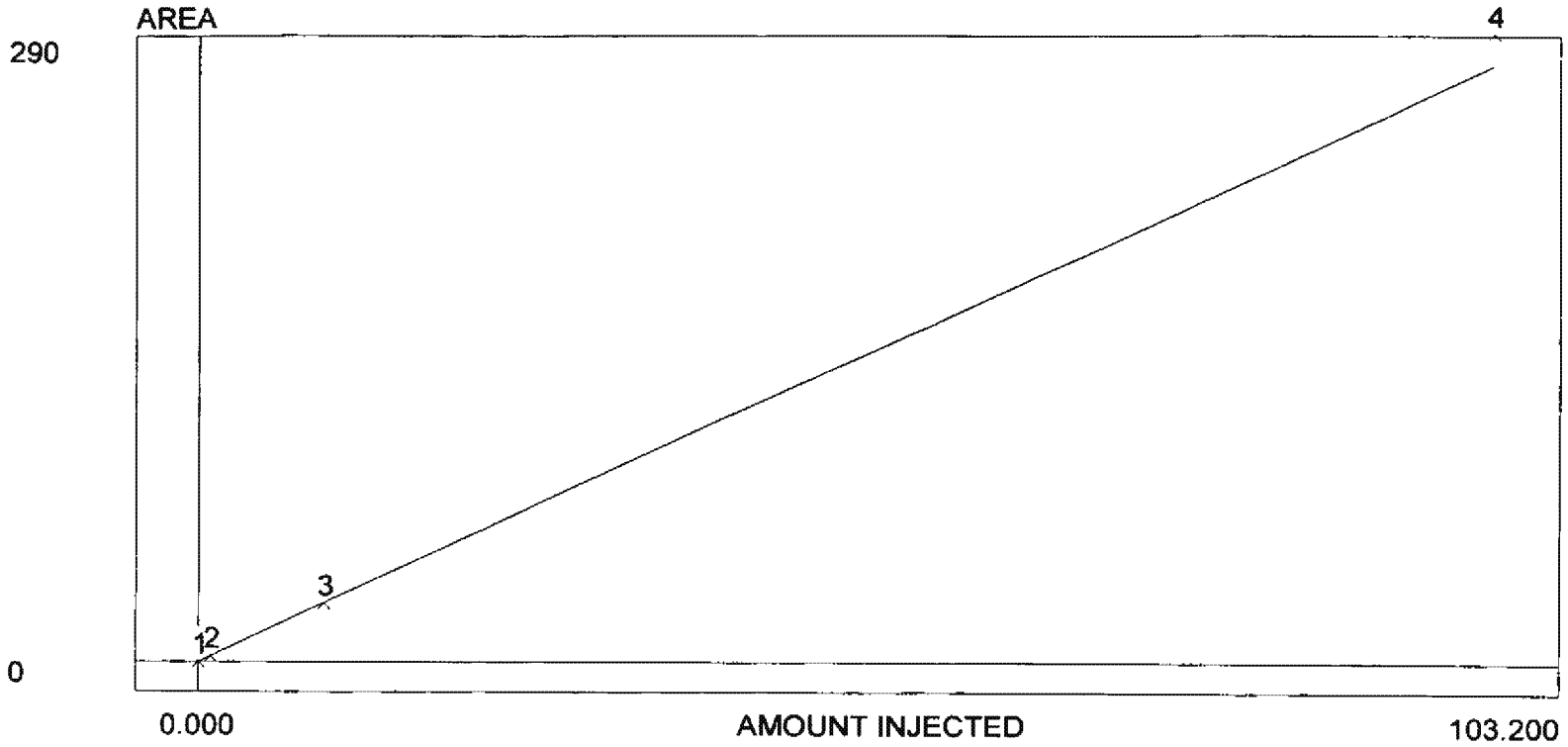
Avg slope of curve: 0.96
Y-axis intercept: 0.00
Linearity: 1.00
Number of levels: 4
SD/rel SD of CF's: 0.5/67.0
Y=0.9596X
r2: 0.9998
Last calibrated: Tue Jun 21 08:26:34 2005

Lvl.	Area/ht.	Amount	CF	Current	Previous #1	Previous #2
1	0.000	0.000	0.000	0.000	N/A	N/A
2	0.980	1.020	0.961	0.980	N/A	N/A
3	10.300	10.110	1.019	10.300	N/A	N/A
4	92.800	103.200	0.899	92.800	N/A	N/A

Component file: ETO2-100.CPT

Peak	Name	Start	End	Calibration	Int.Std	Units
1	Dead Vol / Air	0.000	0.350		0.000	
2	Ambient H2O	0.350	0.600		0.000	
3	Ethylene Oxide	0.600	0.700	2SterigenicsWB.c	0.000	ppm
4	Acetaldehyde	0.700	0.800		0.000	
5	CO2	0.800	1.000		0.000	

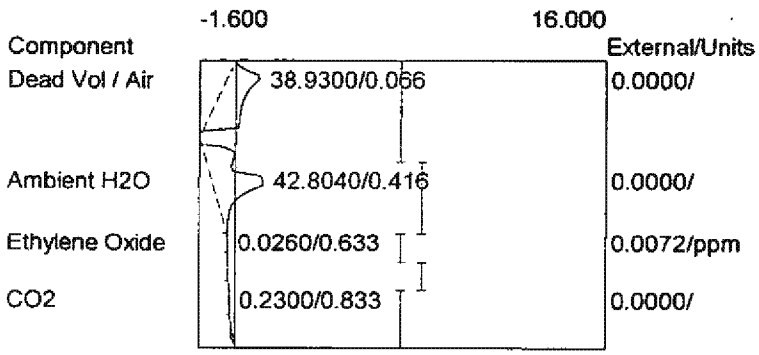
Calibration file: 2SterigenicsWB.cal



Avg slope of curve: 2.81
Y-axis intercept: 0.00
Linearity: 1.00
Number of levels: 4
SD/rel SD of CF's: 1.4/66.9
Y=2.8136X
r2: 1.0000
Last calibrated: Tue Jun 21 08:25:50 2005

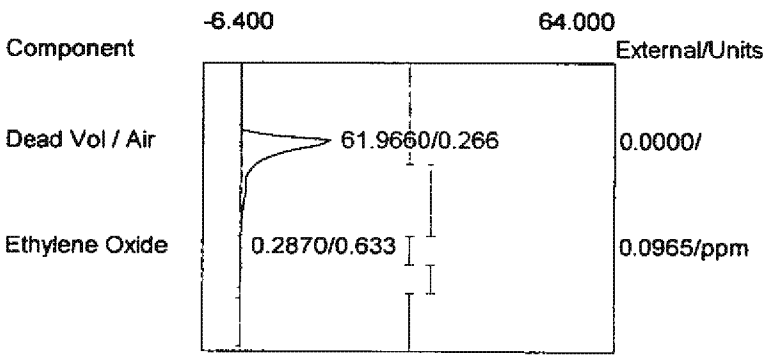
Lvl.	Area/ht.	Amount	CF	Current	Previous #1	Previous #2
1	0.000	0.000	0.000	0.000	N/A	N/A
2	2.740	1.020	2.686	2.740	N/A	N/A
3	28.200	10.110	2.789	28.200	N/A	N/A
4	306.000	103.200	2.965	306.000	N/A	N/A

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: PreCal
Analysis date: 06/21/2005 08:00:06
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB-AMB.CHR (c:\peakwin)
Sample: Ambient Background
Operator: D. Kremer



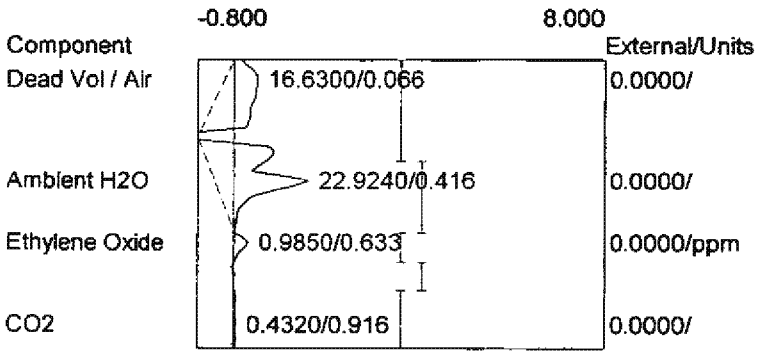
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	38.9300	0.0000	
Ambient H2O	0.416	42.8040	0.0000	
Ethylene Oxide	0.633	0.0260	0.0072	ppm
CO2	0.833	0.2300	0.0000	
		81.9900	0.0072	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: PreCal
Analysis date: 06/21/2005 08:00:06
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB-AMB.CHR (c:\peakwin)
Sample: Ambient Background
Operator: D. Kremer



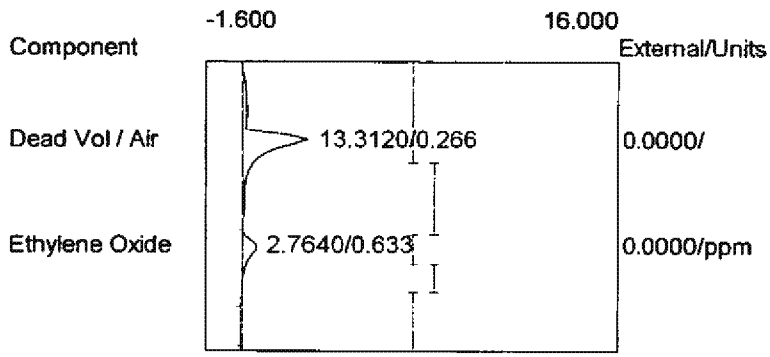
Component	Retention	Area	External	Units
Dead Vol / Air	0.266	61.9660	0.0000	
Ethylene Oxide	0.633	0.2870	0.0965	ppm
		62.2530	0.0965	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: PreCal
Analysis date: 06/21/2005 08:04:32
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB-Cal01.CHR (c:\peakwin)
Sample: 1.020 ppm EtO std
Operator: D. Kremer



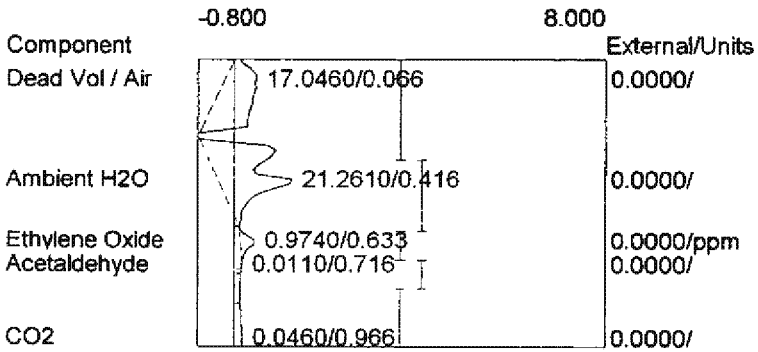
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	16.6300	0.0000	
Ambient H2O	0.416	22.9240	0.0000	
Ethylene Oxide	0.633	0.9850	0.0000	ppm
CO2	0.916	0.4320	0.0000	
		40.9710	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: PreCal
Analysis date: 06/21/2005 08:04:32
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB-Cal01.CHR (c:\peakwin)
Sample: 1.020 ppm EtO std
Operator: D. Kremer



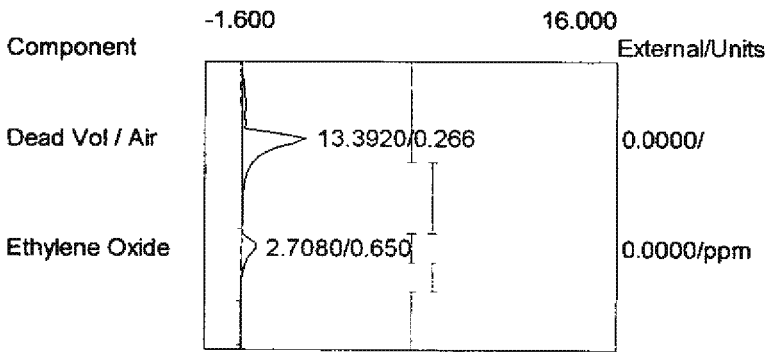
Component	Retention	Area	External	Units
Dead Vol / Air	0.266	13.3120	0.0000	
Ethylene Oxide	0.633	2.7640	0.0000	ppm
		16.0760	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: PreCal
Analysis date: 06/21/2005 08:06:47
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB-Cal02.CHR (c:\peakwin)
Sample: 1.020 ppm EtO std
Operator: D. Kremer



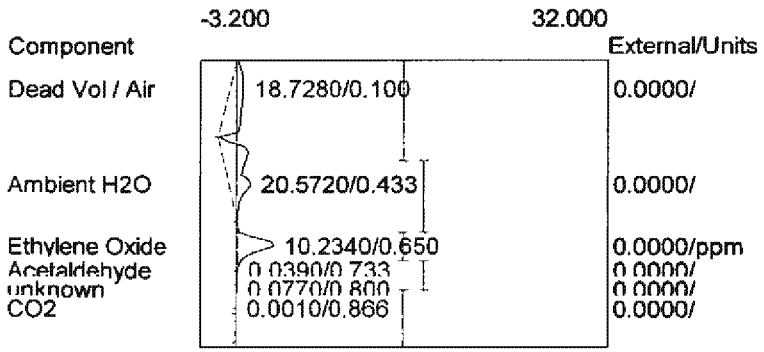
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	17.0460	0.0000	
Ambient H2O	0.416	21.2610	0.0000	
Ethylene Oxide	0.633	0.9740	0.0000	ppm
Acetaldehyde	0.716	0.0110	0.0000	
CO2	0.966	0.0460	0.0000	
		39.3380	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: PreCal
Analysis date: 06/21/2005 08:06:47
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB-Cal02.CHR (c:\peakwin)
Sample: 1.020 ppm EtO std
Operator: D. Kremer



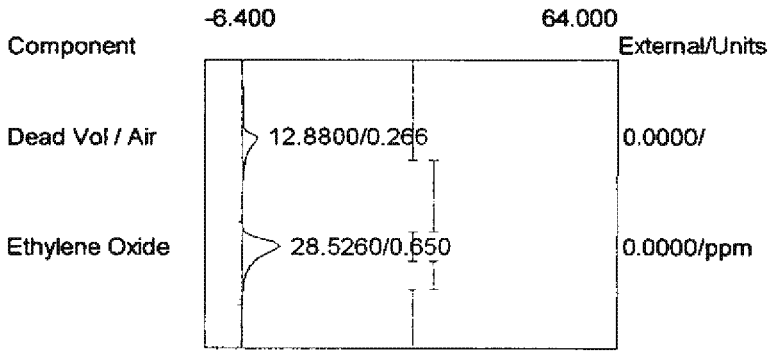
Component	Retention	Area	External	Units
Dead Vol / Air	0.266	13.3920	0.0000	
Ethylene Oxide	0.650	2.7080	0.0000	ppm
		16.1000	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: PreCal
Analysis date: 06/21/2005 08:12:20
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB-Cal03.CHR (c:\peakwin)
Sample: 10.11 ppm EtO std
Operator: D. Kremer



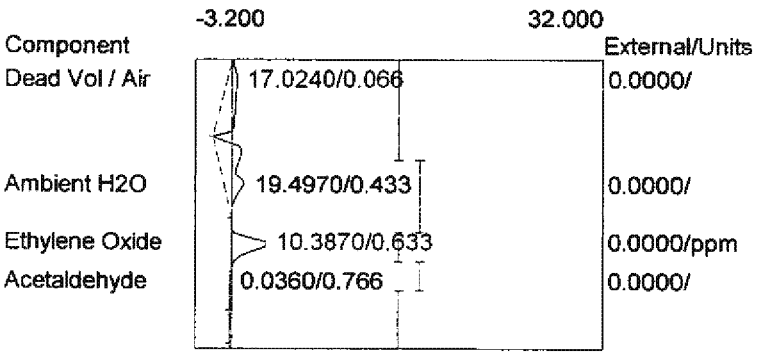
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	18.7280	0.0000	
Ambient H2O	0.433	20.5720	0.0000	
Ethylene Oxide	0.650	10.2340	0.0000	ppm
Acetaldehyde	0.733	0.0390	0.0000	
CO2	0.866	0.0010	0.0000	
		49.5740	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: PreCal
Analysis date: 06/21/2005 08:12:20
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB-Cal03.CHR (c:\peakwin)
Sample: 10.11 ppm EtO std
Operator: D. Kremer



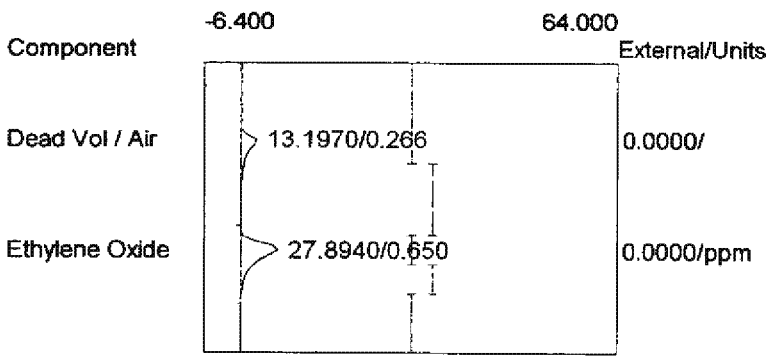
Component	Retention	Area	External	Units
Dead Vol / Air	0.266	12.8800	0.0000	
Ethylene Oxide	0.650	28.5260	0.0000	ppm
		41.4060	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: PreCal
Analysis date: 06/21/2005 08:14:50
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB-Cal04.CHR (c:\peakwin)
Sample: 10.11 ppm EtO std
Operator: D. Kremer



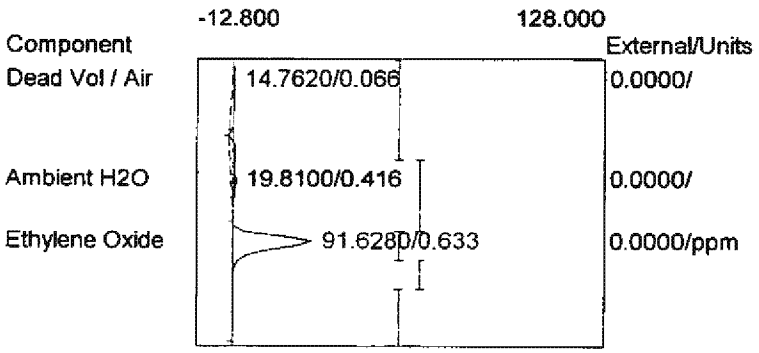
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	17.0240	0.0000	
Ambient H2O	0.433	19.4970	0.0000	
Ethylene Oxide	0.633	10.3870	0.0000	ppm
Acetaldehyde	0.766	0.0360	0.0000	
		46.9440	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: PreCal
Analysis date: 06/21/2005 08:14:50
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB-Cal04.CHR (c:\peakwin)
Sample: 10.11 ppm EtO std
Operator: D. Kremer



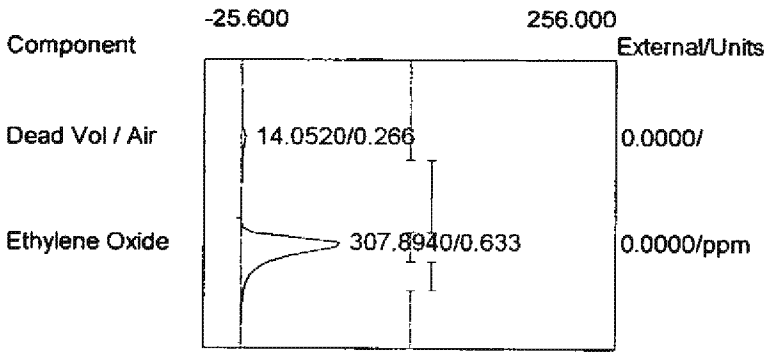
Component	Retention	Area	External	Units
Dead Vol / Air	0.266	13.1970	0.0000	
Ethylene Oxide	0.650	27.8940	0.0000	ppm
		41.0910	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: PreCal
Analysis date: 06/21/2005 08:18:45
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB-Cal05.CHR (c:\peakwin)
Sample: 103.2 ppm EtO std
Operator: D. Kremer



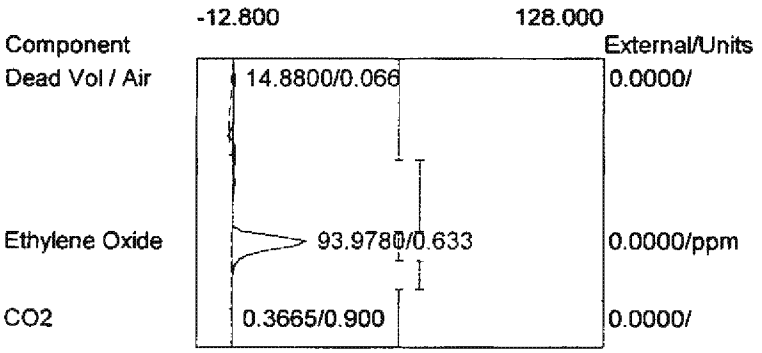
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	14.7620	0.0000	
Ambient H2O	0.416	19.8100	0.0000	
Ethylene Oxide	0.633	91.6280	0.0000	ppm
		126.2000	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: PreCal
Analysis date: 06/21/2005 08:18:45
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB-Cal05.CHR (c:\peakwin)
Sample: 103.2 ppm EtO std
Operator: D. Kremer



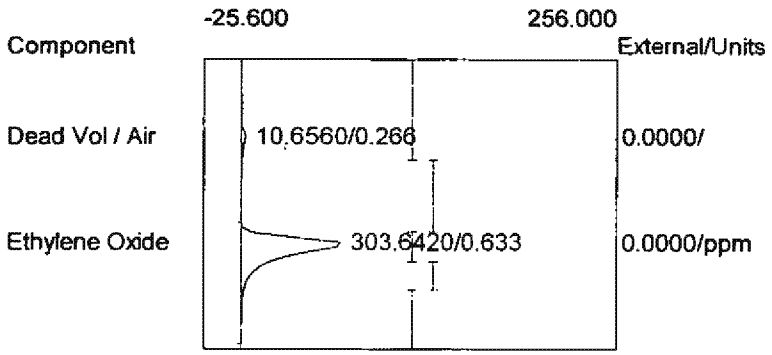
Component	Retention	Area	External	Units
Dead Vol / Air	0.266	14.0520	0.0000	
Ethylene Oxide	0.633	307.8940	0.0000	ppm
		321.9460	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: PreCal
Analysis date: 06/21/2005 08:21:09
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB-Cal06.CHR (c:\peakwin)
Sample: 103.2 ppm EtO std
Operator: D. Kremer



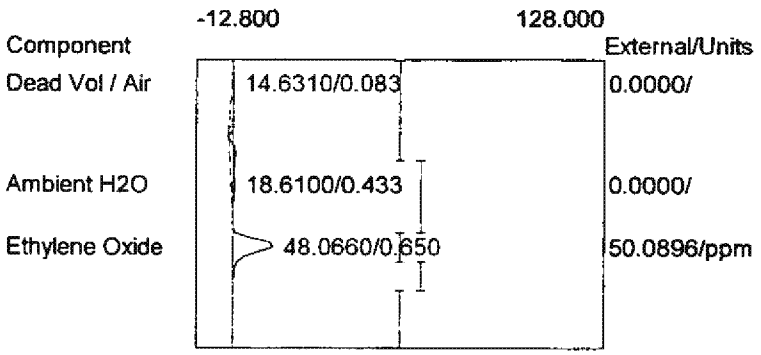
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	14.8800	0.0000	
Ethylene Oxide	0.633	93.9780	0.0000	ppm
CO2	0.900	0.3665	0.0000	
		109.2245	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: PreCal
Analysis date: 06/21/2005 08:21:09
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB-Cal06.CHR (c:\peakwin)
Sample: 103.2 ppm EtO std
Operator: D. Kremer



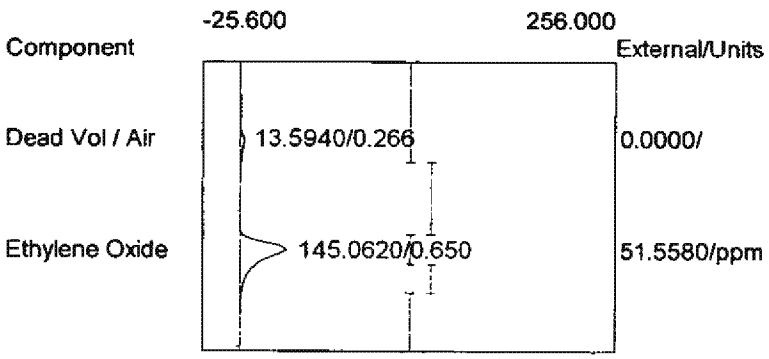
Component	Retention	Area	External	Units
Dead Vol / Air	0.266	10.6560	0.0000	
Ethylene Oxide	0.633	303.6420	0.0000	ppm
		314.2980	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: PreCal
Analysis date: 06/21/2005 08:24:43
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB-Audit.CHR (c:\peakwin)
Sample: 49.0 ppm EtO audit std
Operator: D. Kremer



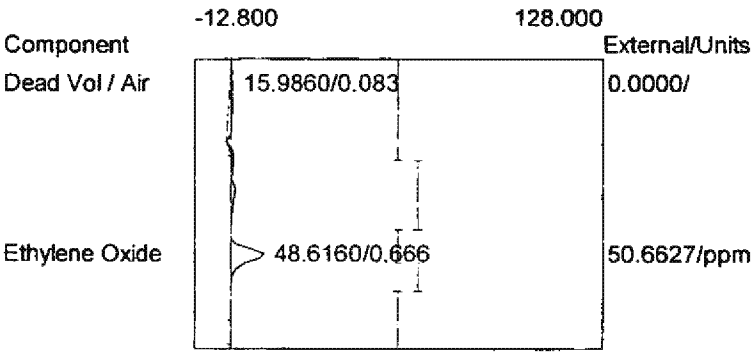
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	14.6310	0.0000	
Ambient H2O	0.433	18.6100	0.0000	
Ethylene Oxide	0.650	48.0660	50.0896	ppm
		81.3070	50.0896	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: PreCal
Analysis date: 06/21/2005 08:24:43
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB-Audit.CHR (c:\peakwin)
Sample: 49.0 ppm EtO audit std
Operator: D. Kremer



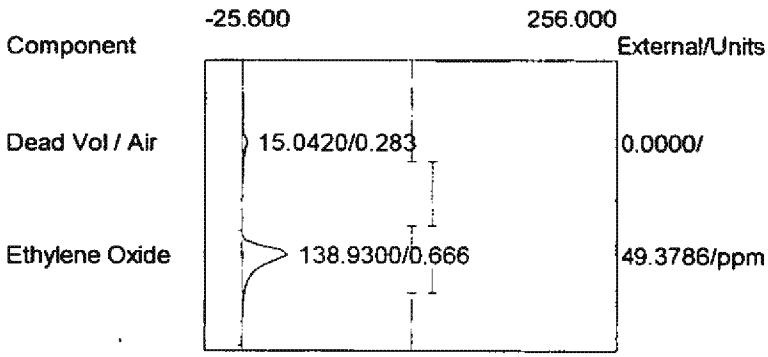
Component	Retention	Area	External	Unit
Dead Vol / Air	0.266	13.5940	0.0000	
Ethylene Oxide	0.650	145.0620	51.5580	ppm
		158.6560	51.5580	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: PostCal
Analysis date: 06/21/2005 13:54:02
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-PostAudit.CHR (c:\peakv
Sample: 49.0 ppm EtO audit std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	15.9860	0.0000	
Ethylene Oxide	0.666	48.6160	50.6627	ppm
		64.6020	50.6627	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:54:02
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-PostAudit.CHR (c:\peakv
Sample: 49.0 ppm EtO audit std
Operator: D. Kremer

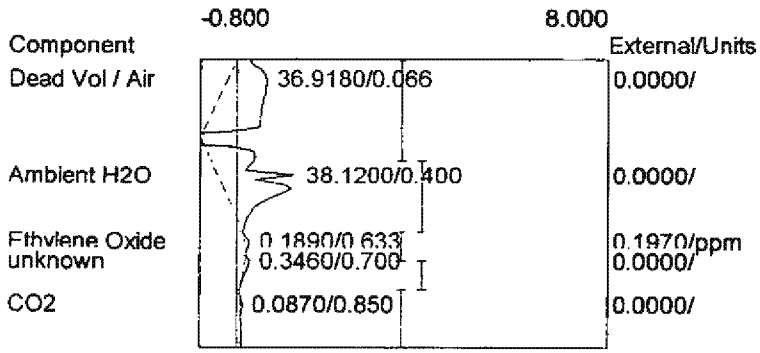


Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	15.0420	0.0000	
Ethylene Oxide	0.666	138.9300	49.3786	ppm
		153.9720	49.3786	

APPENDIX B

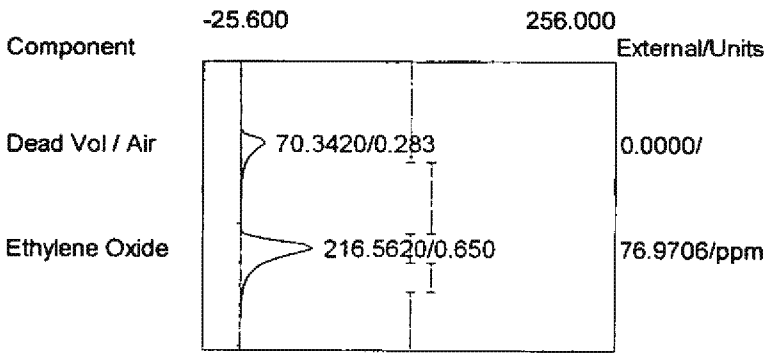
Run #1 Chromatograms – Backvent Phase

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:35:00
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-BV01.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



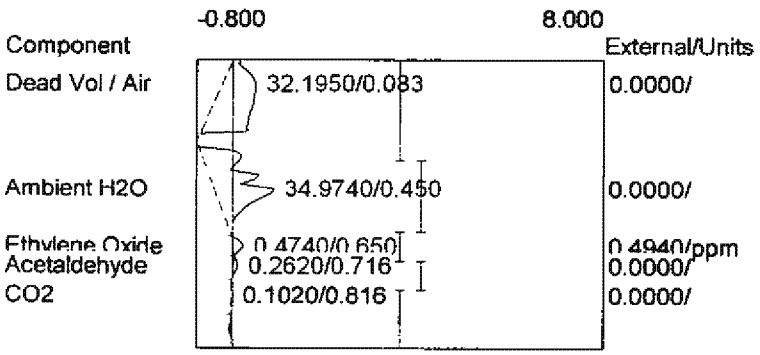
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	36.9180	0.0000	
Ambient H2O	0.400	38.1200	0.0000	
Ethylene Oxide	0.633	0.1890	0.1970	ppm
CO2	0.850	0.0870	0.0000	
		75.3140	0.1970	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:35:00
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-BV01.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



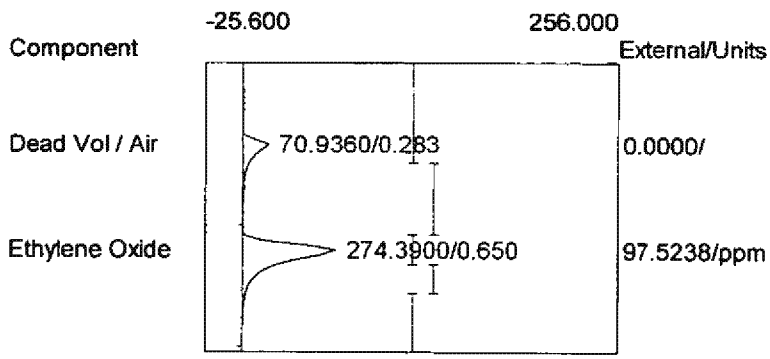
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	70.3420	0.0000	
Ethylene Oxide	0.650	216.5620	76.9706	ppm
		286.9040	76.9706	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:36:08
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-BV02.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



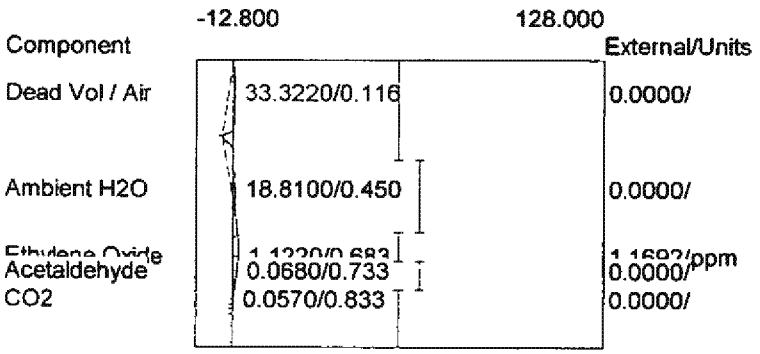
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	32.1950	0.0000	
Ambient H2O	0.450	34.9740	0.0000	
Ethylene Oxide	0.650	0.4740	0.4940	ppm
Acetaldehyde	0.716	0.2620	0.0000	
CO2	0.816	0.1020	0.0000	
		68.0070	0.4940	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:36:08
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-BV02.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



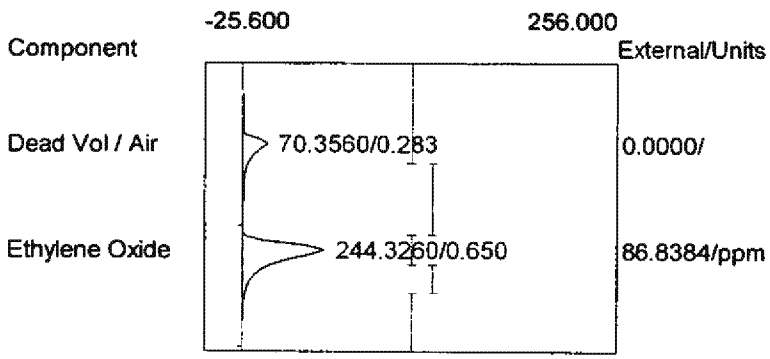
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	70.9360	0.0000	
Ethylene Oxide	0.650	274.3900	97.5238	ppm
		345.3260	97.5238	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:37:33
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-BV03.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



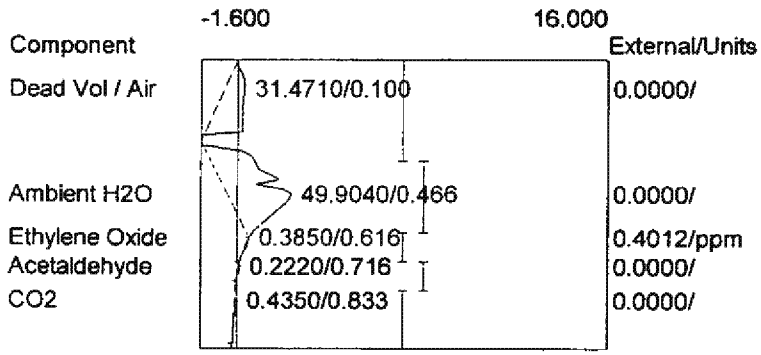
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	33.3220	0.0000	
Ambient H2O	0.450	18.8100	0.0000	
Ethylene Oxide	0.683	1.1220	1.1692	ppm
Acetaldehyde	0.733	0.0680	0.0000	
CO2	0.833	0.0570	0.0000	
		53.3790	1.1692	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:37:33
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-BV03.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



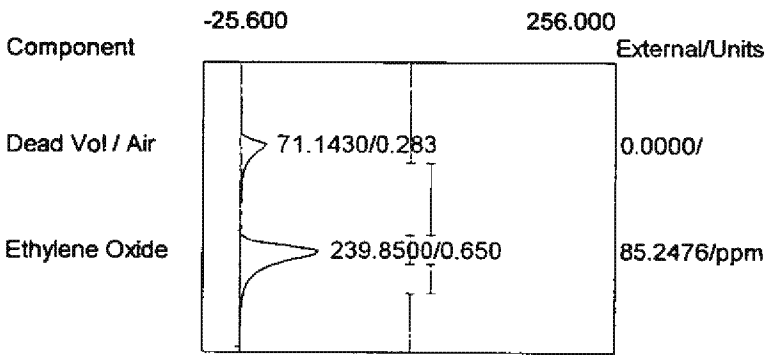
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	70.3560	0.0000	
Ethylene Oxide	0.650	244.3260	86.8384	ppm
		314.6820	86.8384	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:38:53
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-BV04.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



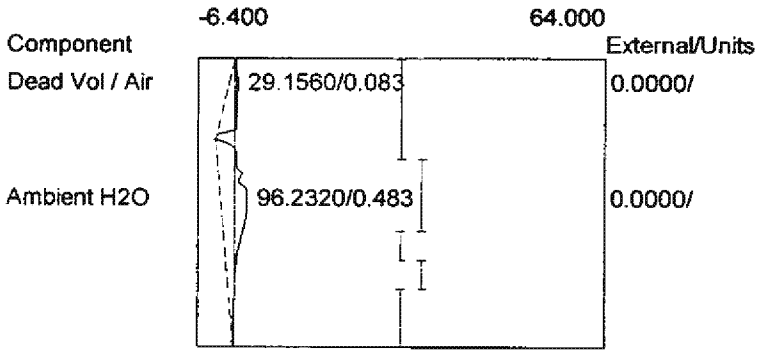
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	31.4710	0.0000	
Ambient H2O	0.466	49.9040	0.0000	
Ethylene Oxide	0.616	0.3850	0.4012	ppm
Acetaldehyde	0.716	0.2220	0.0000	
CO2	0.833	0.4350	0.0000	
		82.4170	0.4012	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:38:53
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-BV04.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



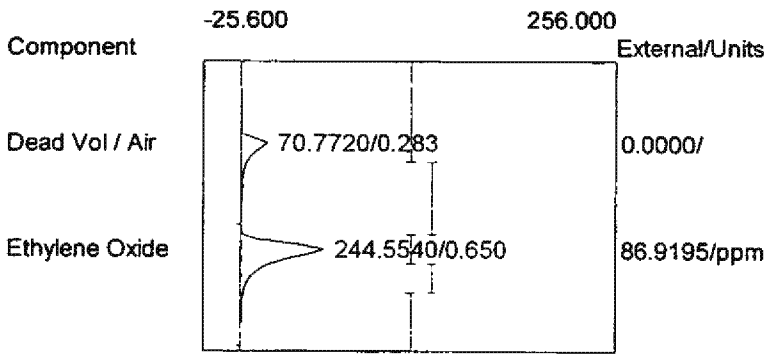
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	71.1430	0.0000	
Ethylene Oxide	0.650	239.8500	85.2476	ppm
		310.9930	85.2476	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:40:15
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-BV05.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



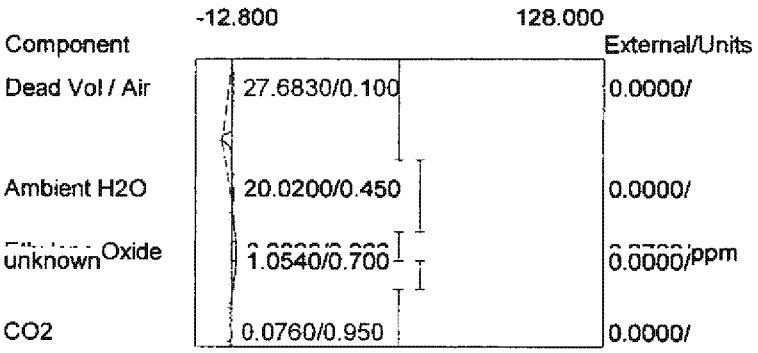
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	29.1560	0.0000	
Ambient H2O	0.483	96.2320	0.0000	
		125.3880	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:40:15
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-BV05.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



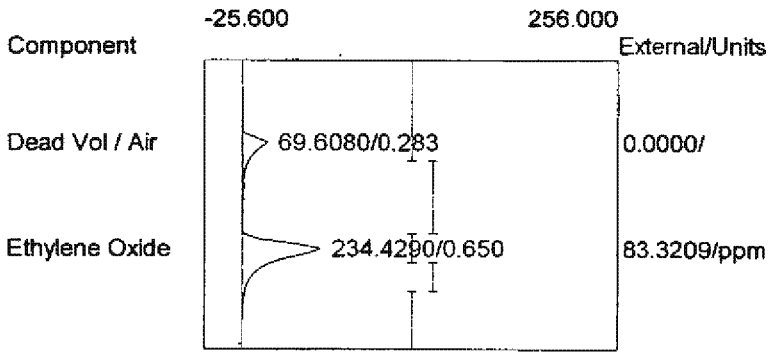
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	70.7720	0.0000	
Ethylene Oxide	0.650	244.5540	86.9195	ppm
		315.3260	86.9195	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:41:26
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-BV06.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



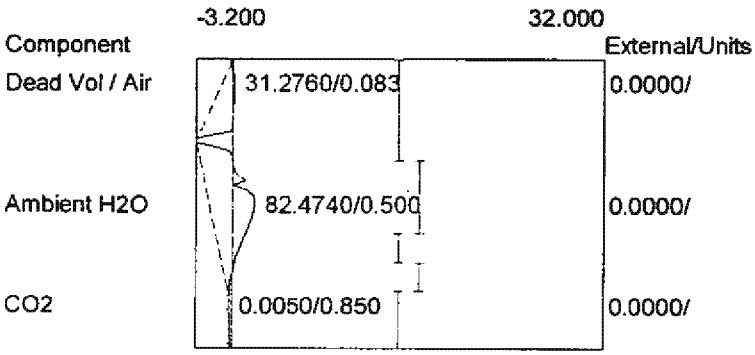
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	27.6830	0.0000	
Ambient H2O	0.450	20.0200	0.0000	
Ethylene Oxide	0.666	0.2680	0.2793	ppm
CO2	0.950	0.0760	0.0000	
		48.0470	0.2793	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:41:26
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-BV06.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



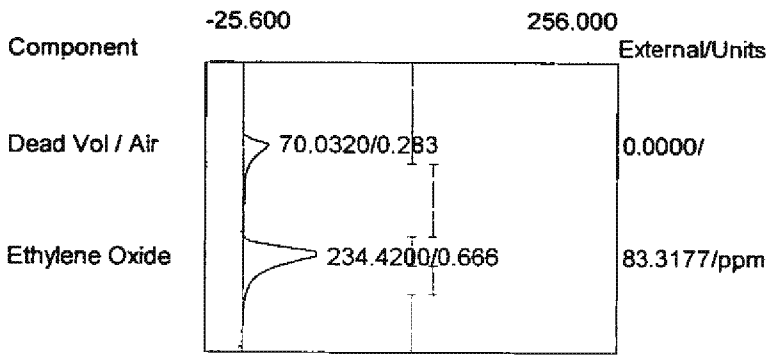
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	69.6080	0.0000	
Ethylene Oxide	0.650	234.4290	83.3209	ppm
		304.0370	83.3209	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:42:56
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-BV07.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



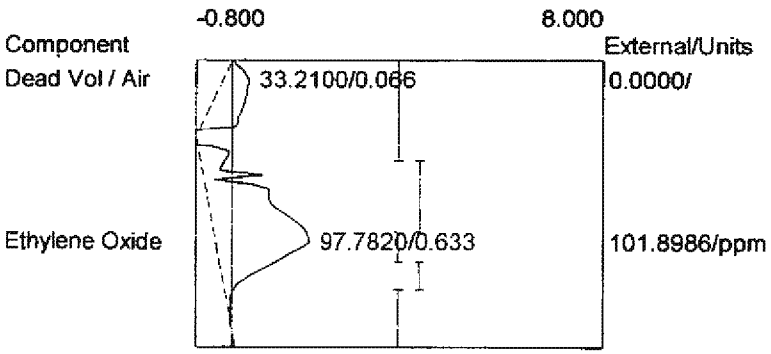
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	31.2760	0.0000	
Ambient H2O	0.500	82.4740	0.0000	
CO2	0.850	0.0050	0.0000	
		113.7550	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:42:56
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-BV07.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



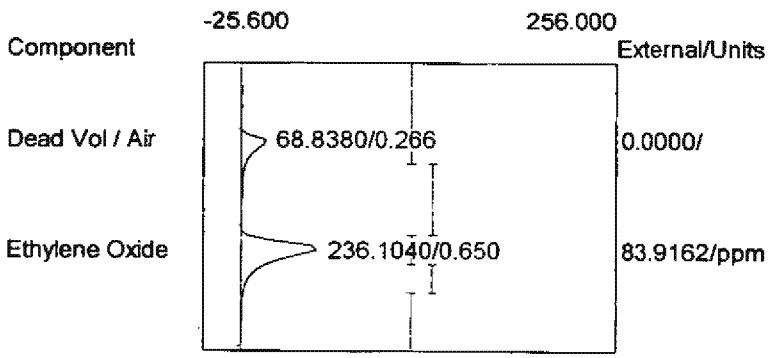
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	70.0320	0.0000	
Ethylene Oxide	0.666	234.4200	83.3177	ppm
		304.4520	83.3177	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:44:02
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-BV08.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



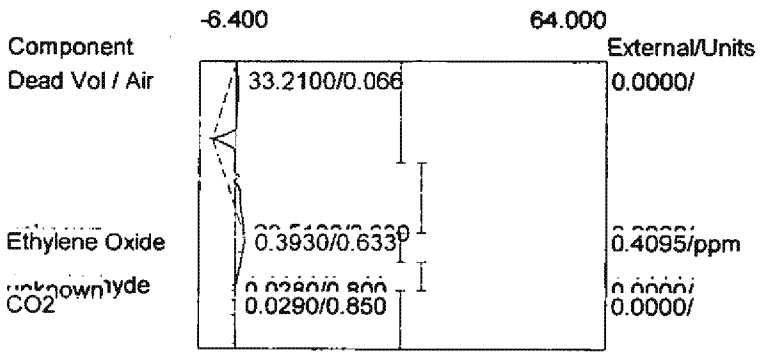
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	33.2100	0.0000	
Ethylene Oxide	0.633	97.7820	101.8986	ppm
		130.9920	101.8986	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:44:02
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-BV08.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



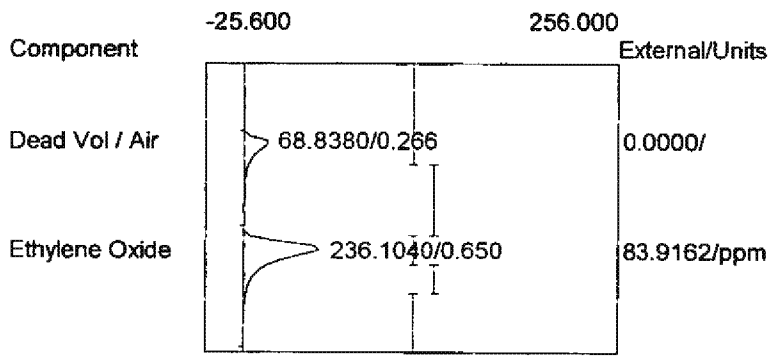
Component	Retention	Area	External	Unit
Dead Vol / Air	0.266	68.8380	0.0000	
Ethylene Oxide	0.650	236.1040	83.9162	ppm
		304.9420	83.9162	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:44:02
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-BV08.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



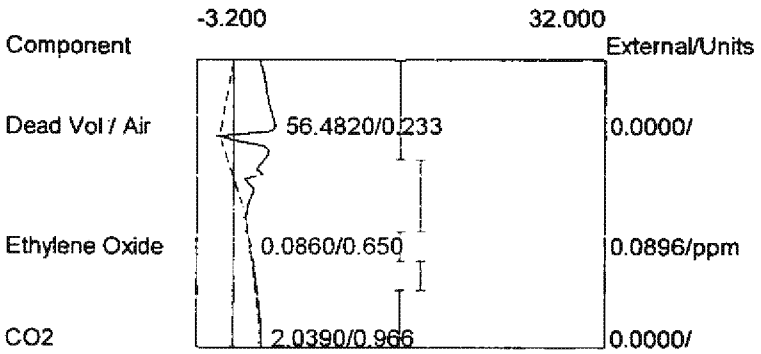
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	33.2100	0.0000	
Ethylene Oxide	0.633	0.3930	0.4095	ppm
Acetaldehyde	0.783	0.0290	0.0000	
CO2	0.850	0.0290	0.0000	
		33.6610	0.4095	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:44:02
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-BV08.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



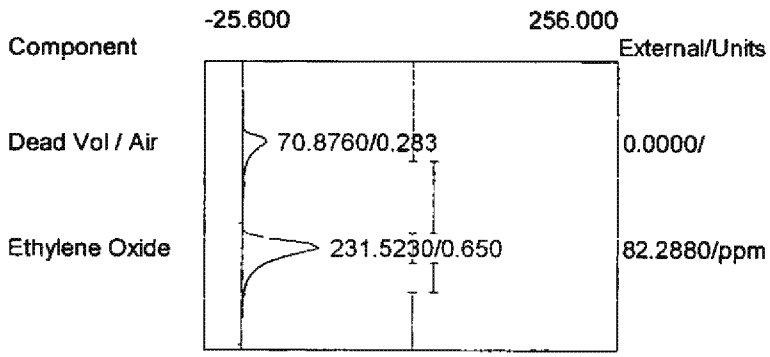
Component	Retention	Area	External	Unit
Dead Vol / Air	0.266	68.8380	0.0000	
Ethylene Oxide	0.650	236.1040	83.9162	ppm
		304.9420	83.9162	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:45:52
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-BV09.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



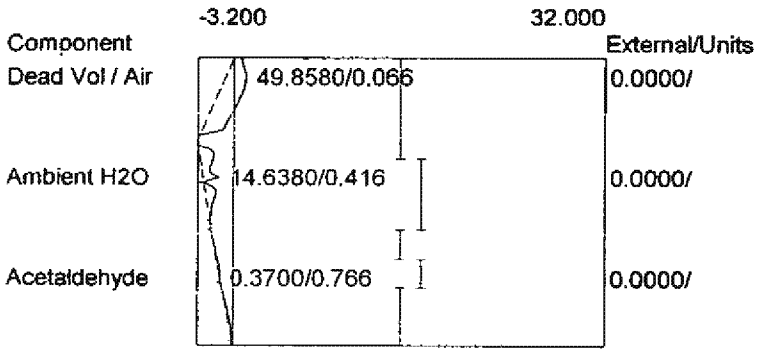
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	56.4820	0.0000	
Ethylene Oxide	0.650	0.0860	0.0896	ppm
CO2	0.966	2.0390	0.0000	
		58.6070	0.0896	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:45:52
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-BV09.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



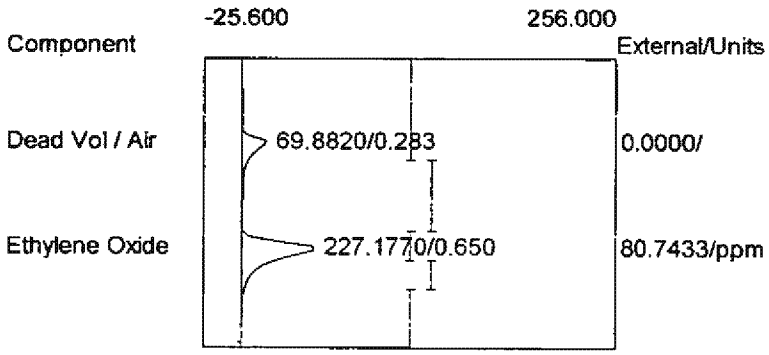
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	70.8760	0.0000	
Ethylene Oxide	0.650	231.5230	82.2880	ppm
		302.3990	82.2880	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:47:09
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-BV10.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



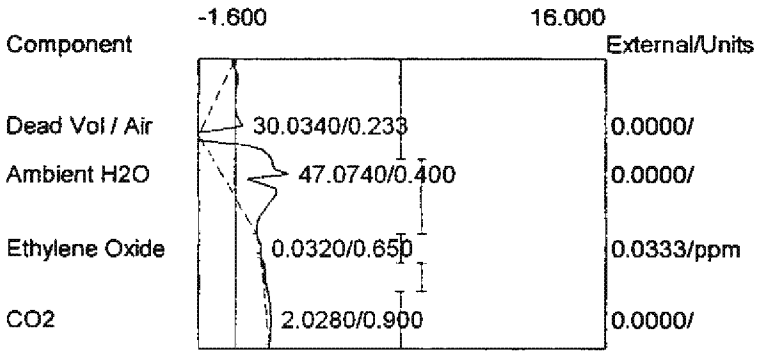
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	49.8580	0.0000	
Ambient H2O	0.416	14.6380	0.0000	
Acetaldehyde	0.766	0.3700	0.0000	
		64.8660	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:47:09
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-BV10.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



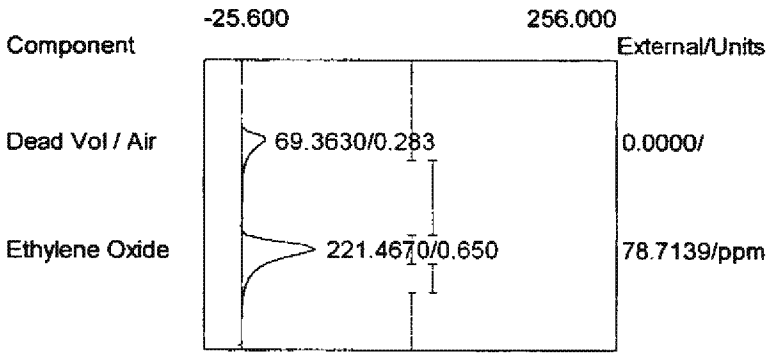
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	69.8820	0.0000	
Ethylene Oxide	0.650	227.1770	80.7433	ppm
		297.0590	80.7433	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:48:42
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-BV11.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	30.0340	0.0000	
Ambient H2O	0.400	47.0740	0.0000	
Ethylene Oxide	0.650	0.0320	0.0333	ppm
CO2	0.900	2.0280	0.0000	
		79.1680	0.0333	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1BV
Analysis date: 06/21/2005 08:48:42
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-BV11.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer

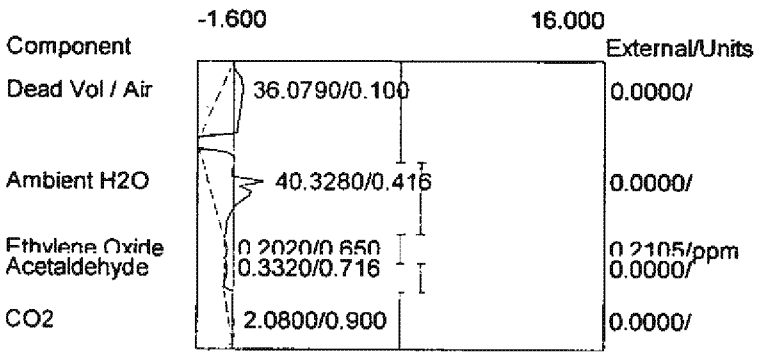


Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	69.3630	0.0000	
Ethylene Oxide	0.650	221.4670	78.7139	ppm
		290.8300	78.7139	

APPENDIX C

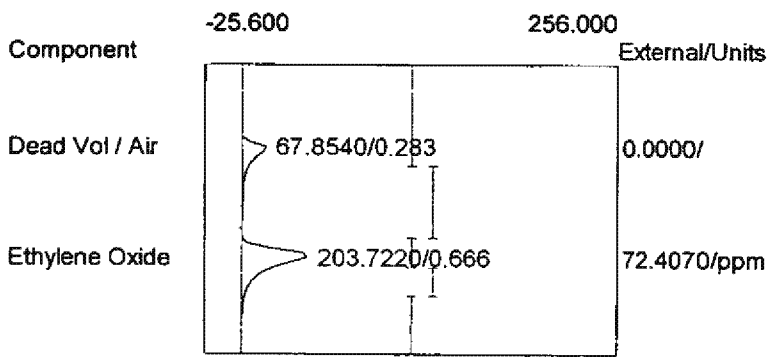
Run #2 Chromatograms – Backvent Phase

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:09:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-BV01.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



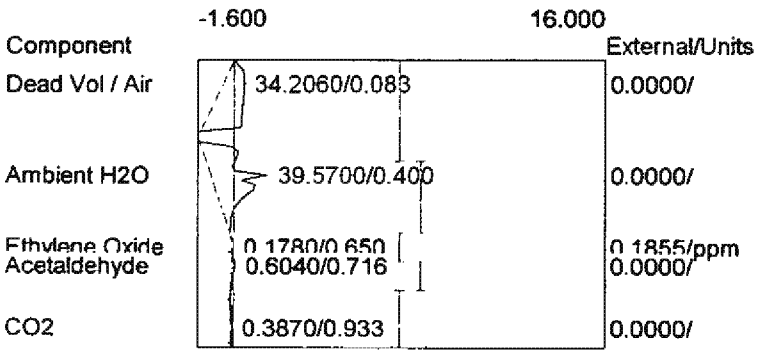
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	36.0790	0.0000	
Ambient H2O	0.416	40.3280	0.0000	
Ethylene Oxide	0.650	0.2020	0.2105	ppm
Acetaldehyde	0.716	0.3320	0.0000	
CO2	0.900	2.0800	0.0000	
		79.0210	0.2105	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:09:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-BV01.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



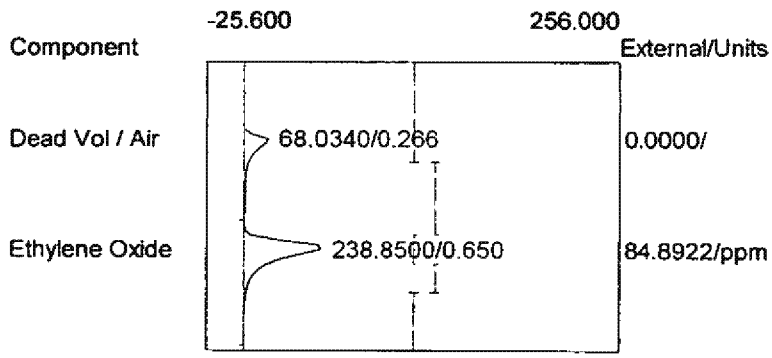
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	67.8540	0.0000	
Ethylene Oxide	0.666	203.7220	72.4070	ppm
		271.5760	72.4070	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:10:15
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-BV02.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



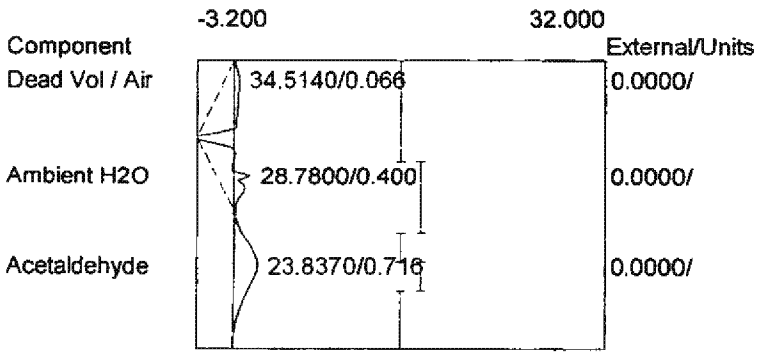
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	34.2060	0.0000	
Ambient H2O	0.400	39.5700	0.0000	
Ethylene Oxide	0.650	0.1780	0.1855	ppm
Acetaldehyde	0.716	0.6040	0.0000	
CO2	0.933	0.3870	0.0000	
		74.9450	0.1855	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:10:15
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-BV02.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



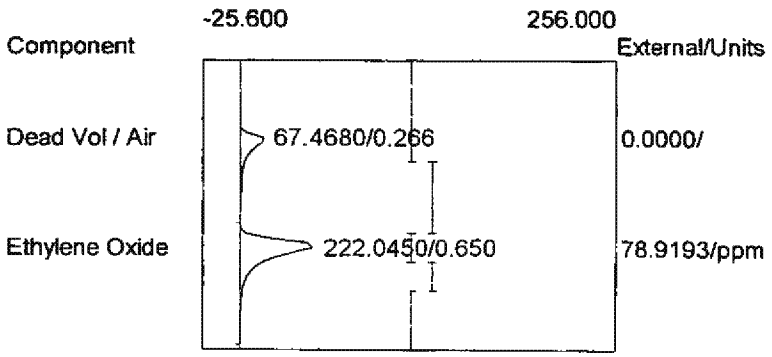
Component	Retention	Area	External	Unit
Dead Vol / Air	0.266	68.0340	0.0000	
Ethylene Oxide	0.650	238.8500	84.8922	ppm
		306.8840	84.8922	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:11:31
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-BV03.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



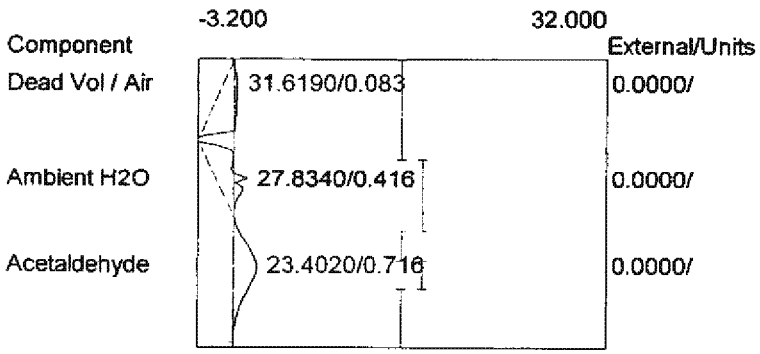
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	34.5140	0.0000	
Ambient H2O	0.400	28.7800	0.0000	
Acetaldehyde	0.716	23.8370	0.0000	
		87.1310	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:11:31
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-BV03.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



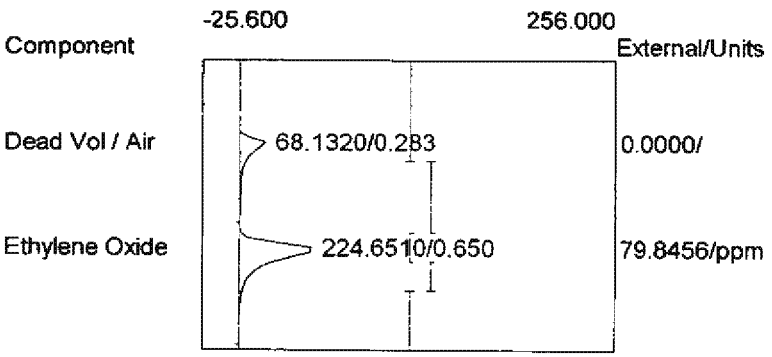
Component	Retention	Area	External	Unit
Dead Vol / Air	0.266	67.4680	0.0000	
Ethylene Oxide	0.650	222.0450	78.9193	ppm
		289.5130	78.9193	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:12:45
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-BV04.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



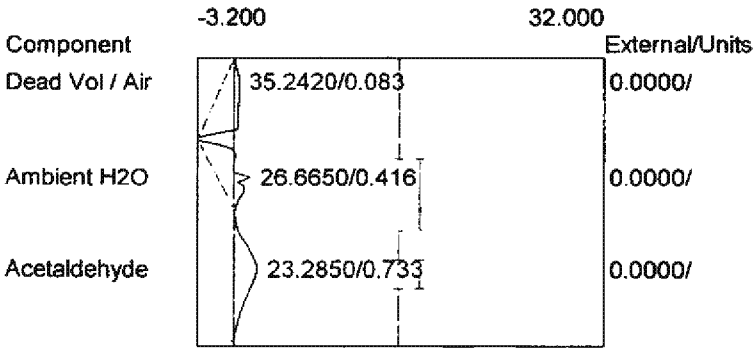
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	31.6190	0.0000	
Ambient H2O	0.416	27.8340	0.0000	
Acetaldehyde	0.716	23.4020	0.0000	
		82.8550	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:12:45
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-BV04.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



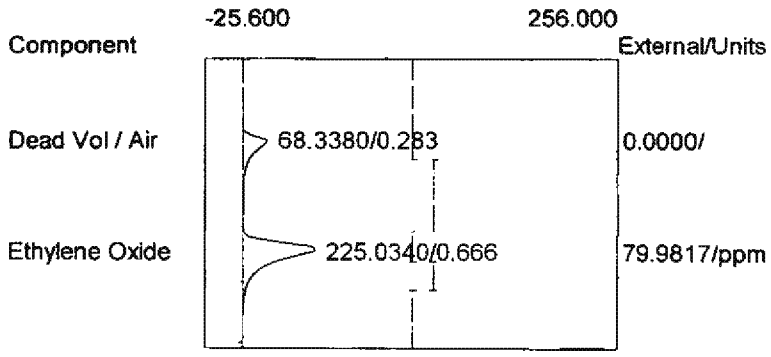
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	68.1320	0.0000	
Ethylene Oxide	0.650	224.6510	79.8456	ppm
		292.7830	79.8456	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:14:00
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-BV05.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



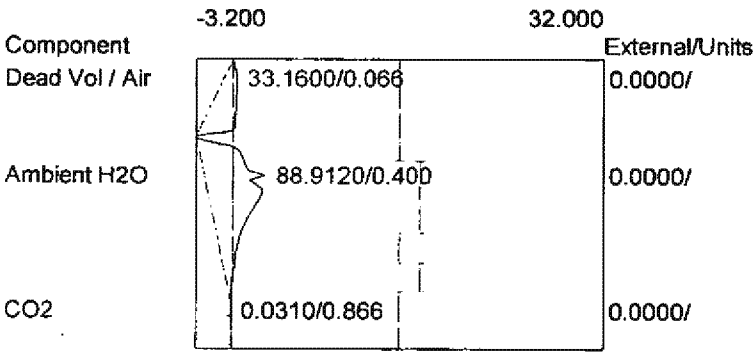
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	35.2420	0.0000	
Ambient H2O	0.416	26.6650	0.0000	
Acetaldehyde	0.733	23.2850	0.0000	
		85.1920	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:14:00
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-BV05.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



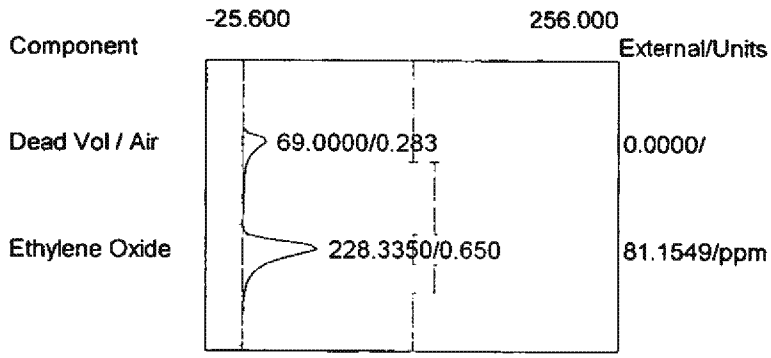
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	68.3380	0.0000	
Ethylene Oxide	0.666	225.0340	79.9817	ppm
		293.3720	79.9817	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:15:31
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-BV06.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



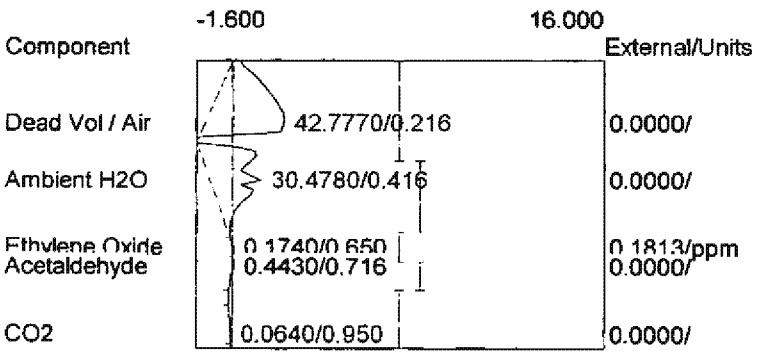
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	33.1600	0.0000	
Ambient H2O	0.400	88.9120	0.0000	
CO2	0.866	0.0310	0.0000	
		122.1030	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:15:31
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-BV06.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



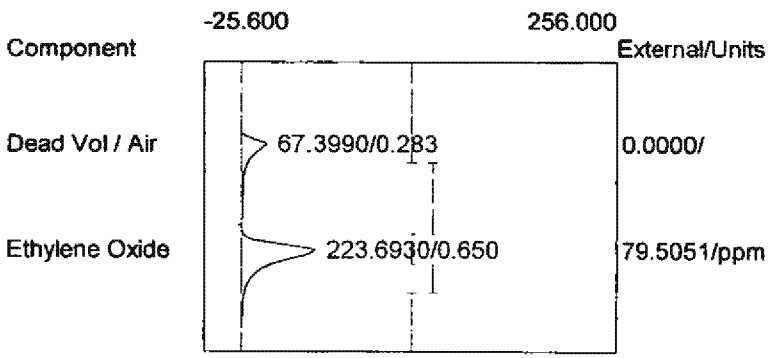
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	69.0000	0.0000	
Ethylene Oxide	0.650	228.3350	81.1549	ppm
		297.3350	81.1549	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:17:00
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-BV07.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



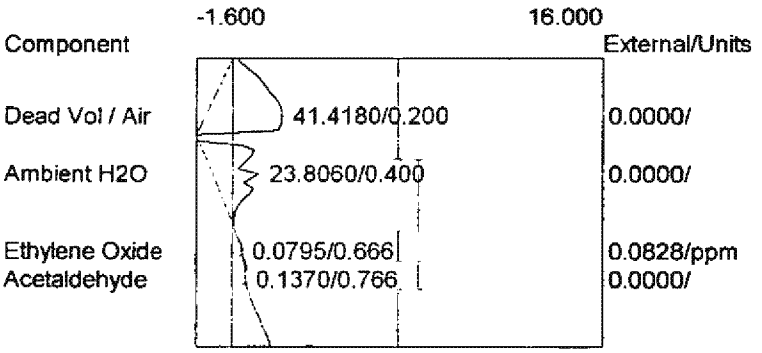
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	42.7770	0.0000	
Ambient H2O	0.416	30.4780	0.0000	
Ethylene Oxide	0.650	0.1740	0.1813	ppm
Acetaldehyde	0.716	0.4430	0.0000	
CO2	0.950	0.0640	0.0000	
		73.9360	0.1813	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:17:00
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-BV07.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



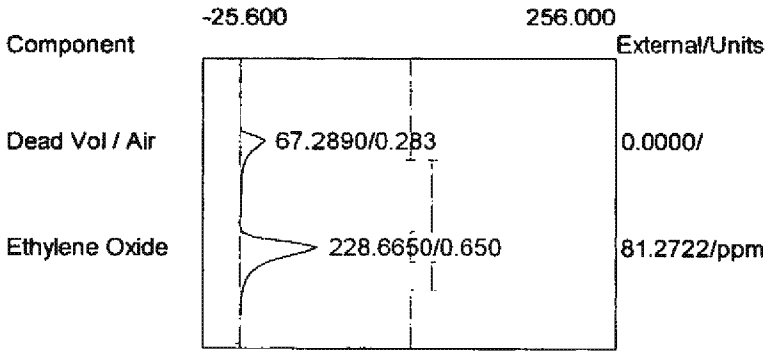
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	67.3990	0.0000	
Ethylene Oxide	0.650	223.6930	79.5051	ppm
		291.0920	79.5051	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:18:30
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-BV08.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



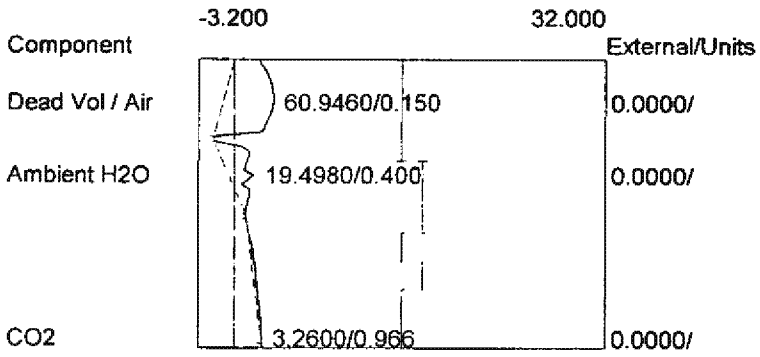
Component	Retention	Area	External	Units
Dead Vol / Air	0.200	41.4180	0.0000	
Ambient H2O	0.400	23.8060	0.0000	
Ethylene Oxide	0.666	0.0795	0.0828	ppm
Acetaldehyde	0.766	0.1370	0.0000	
		65.4405	0.0828	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:18:30
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-BV08.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



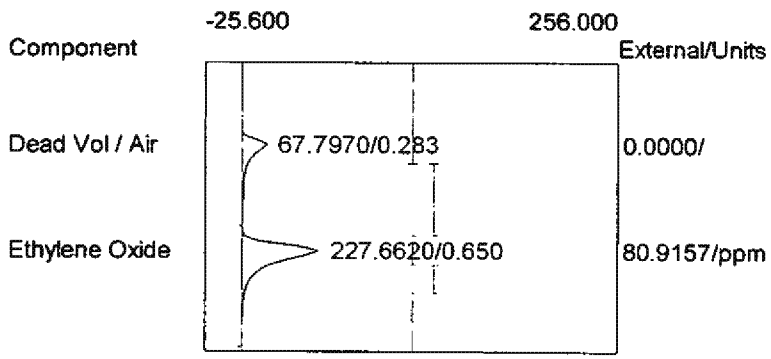
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	67.2890	0.0000	
Ethylene Oxide	0.650	228.6650	81.2722	ppm
		295.9540	81.2722	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:20:02
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-BV09.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



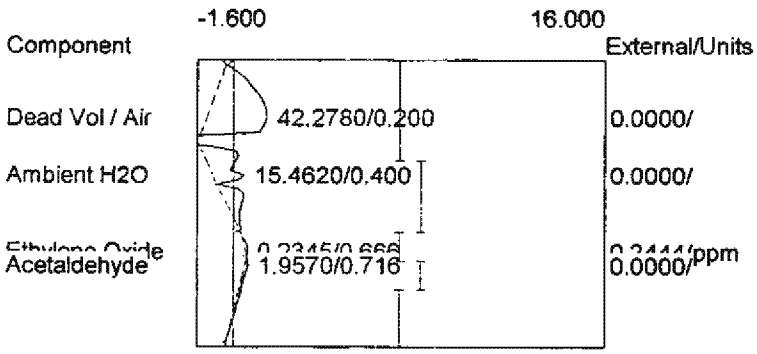
Component	Retention	Area	External	Units
Dead Vol / Air	0.150	60.9460	0.0000	
Ambient H2O	0.400	19.4980	0.0000	
CO2	0.966	3.2600	0.0000	
		83.7040	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:20:02
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-BV09.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



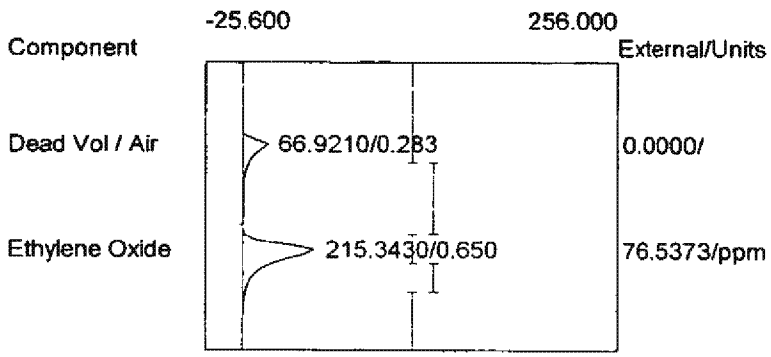
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	67.7970	0.0000	
Ethylene Oxide	0.650	227.6620	80.9157	ppm
		295.4590	80.9157	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:21:31
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-BV10.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



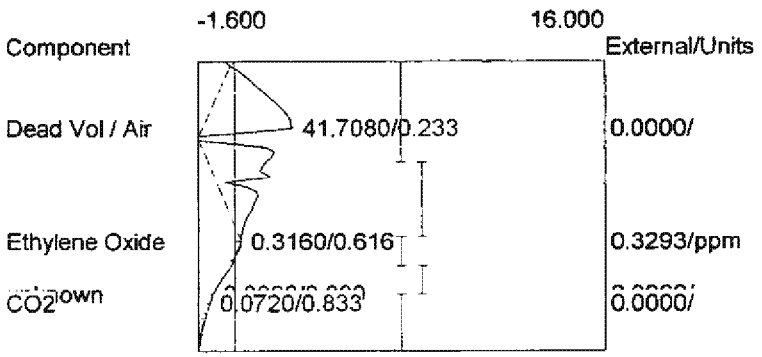
Component	Retention	Area	External	Units
Dead Vol / Air	0.200	42.2780	0.0000	
Ambient H2O	0.400	15.4620	0.0000	
Ethylene Oxide	0.666	0.2345	0.2444	ppm
Acetaldehyde	0.716	1.9570	0.0000	
		59.9315	0.2444	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:21:31
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-BV10.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



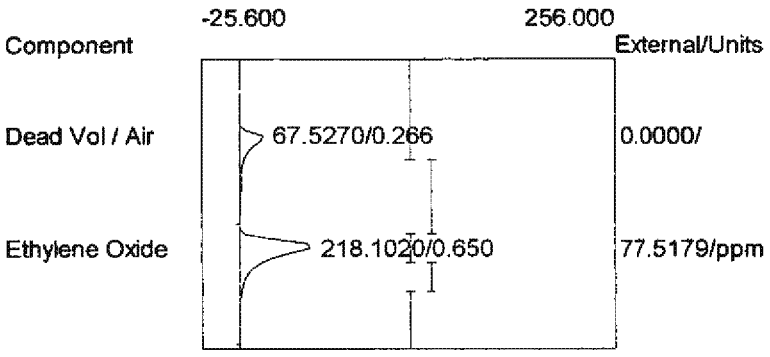
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	66.9210	0.0000	
Ethylene Oxide	0.650	215.3430	76.5373	ppm
		282.2640	76.5373	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:23:00
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-BV11.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	41.7080	0.0000	
Ethylene Oxide	0.616	0.3160	0.3293	ppm
CO2	0.833	0.0720	0.0000	
		42.0960	0.3293	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2BV
Analysis date: 06/21/2005 09:23:00
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-BV11.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer

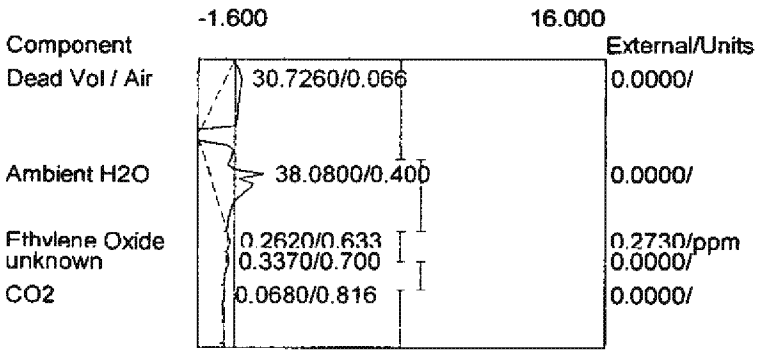


Component	Retention	Area	External	Unit
Dead Vol / Air	0.266	67.5270	0.0000	
Ethylene Oxide	0.650	218.1020	77.5179	ppm
		285.6290	77.5179	

APPENDIX D

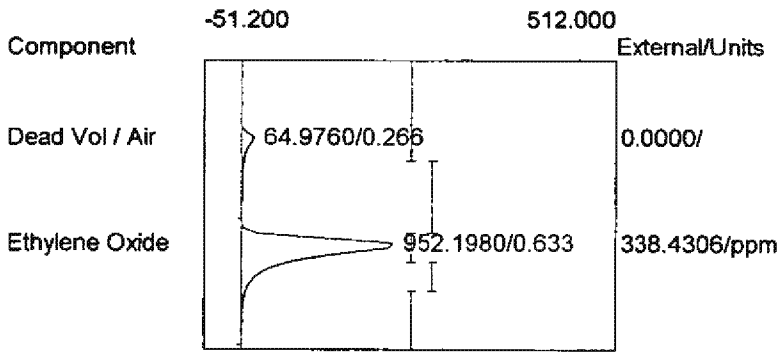
Run #3 Chromatograms – Backvent Phase

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 09:49:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-BV01.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



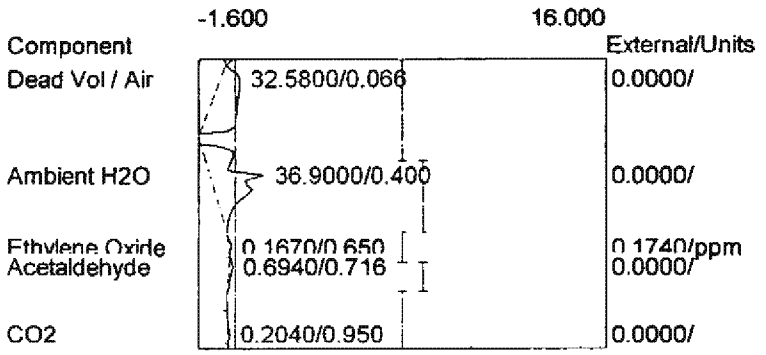
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	30.7260	0.0000	
Ambient H2O	0.400	38.0800	0.0000	
Ethylene Oxide	0.633	0.2620	0.2730	ppm
CO2	0.816	0.0680	0.0000	
		69.1360	0.2730	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 09:49:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-BV01.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



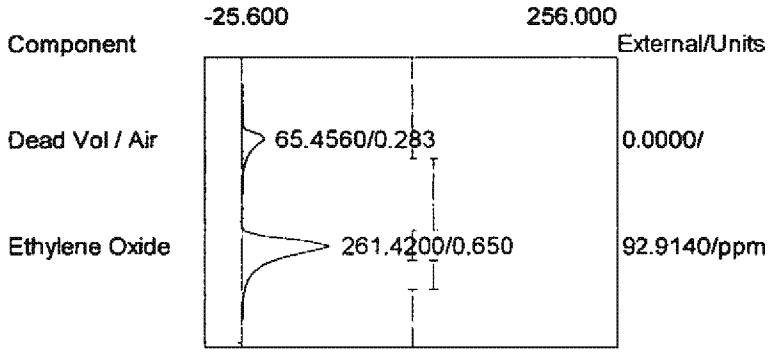
Component	Retention	Area	External	Unit
Dead Vol / Air	0.266	64.9760	0.0000	
Ethylene Oxide	0.633	952.1980	338.4306	ppm
		1017.1740	338.4306	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 09:50:14
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-BV02.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



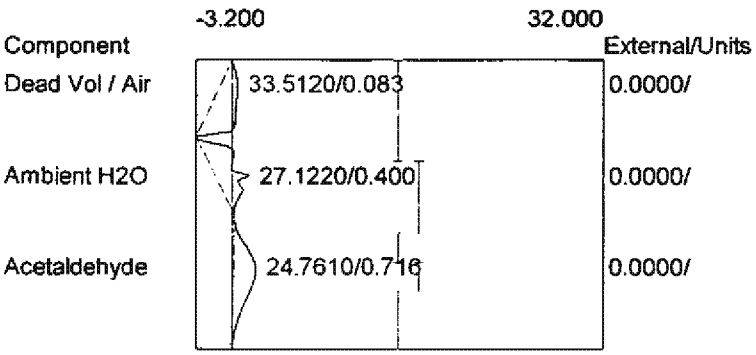
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	32.5800	0.0000	
Ambient H2O	0.400	36.9000	0.0000	
Ethylene Oxide	0.650	0.1670	0.1740	ppm
Acetaldehyde	0.716	0.6940	0.0000	
CO2	0.950	0.2040	0.0000	
		70.5450	0.1740	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 09:50:14
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-BV02.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



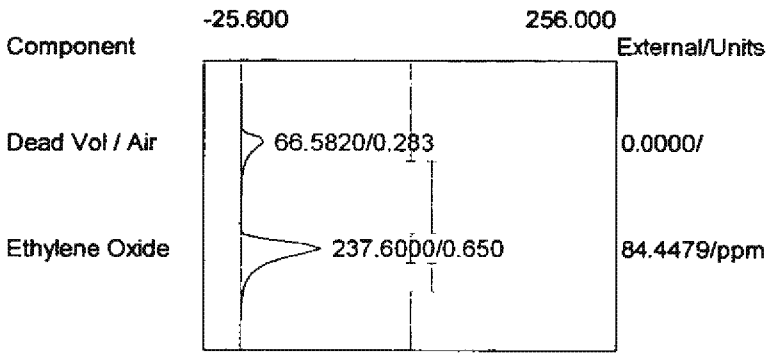
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.4560	0.0000	
Ethylene Oxide	0.650	261.4200	92.9140	ppm
		326.8760	92.9140	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 09:51:30
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-BV03.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



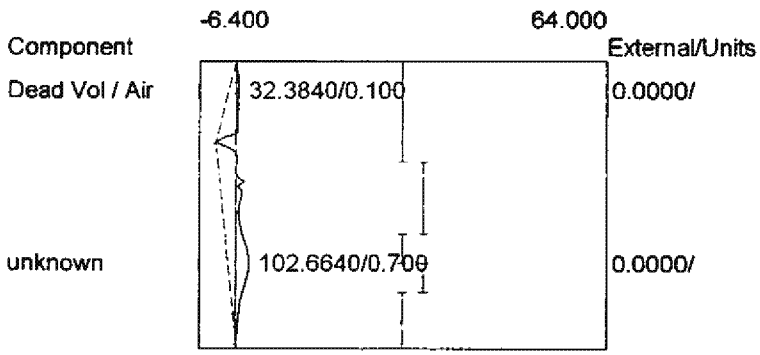
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	33.5120	0.0000	
Ambient H2O	0.400	27.1220	0.0000	
Acetaldehyde	0.716	24.7610	0.0000	
		85.3950	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 09:51:30
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-BV03.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



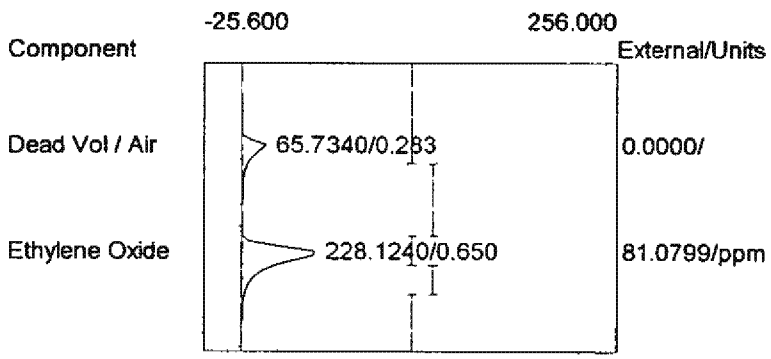
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	66.5820	0.0000	
Ethylene Oxide	0.650	237.6000	84.4479	ppm
		304.1820	84.4479	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 09:52:47
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-BV04.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



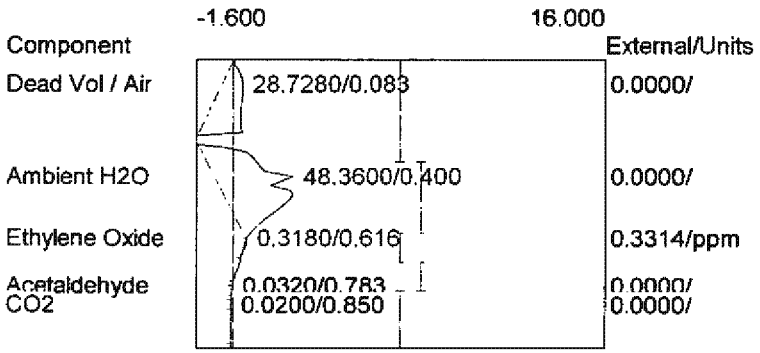
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	32.3840	0.0000	
		32.3840	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 09:52:47
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-BV04.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



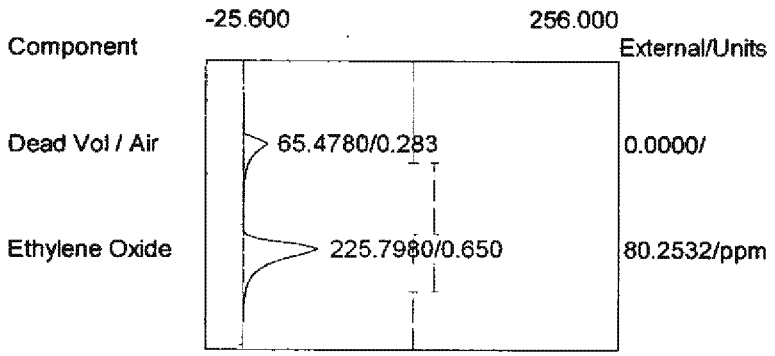
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.7340	0.0000	
Ethylene Oxide	0.650	228.1240	81.0799	ppm
		293.8580	81.0799	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 09:54:17
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-BV05.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



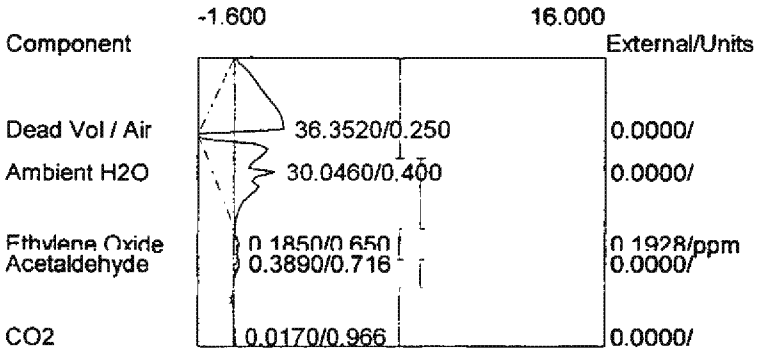
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	28.7280	0.0000	
Ambient H2O	0.400	48.3600	0.0000	
Ethylene Oxide	0.616	0.3180	0.3314	ppm
Acetaldehyde	0.783	0.0320	0.0000	
CO2	0.850	0.0200	0.0000	
		77.4580	0.3314	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 09:54:17
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-BV05.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



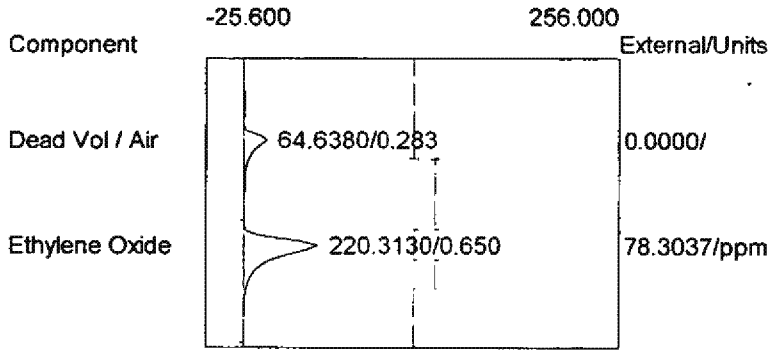
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.4780	0.0000	
Ethylene Oxide	0.650	225.7980	80.2532	ppm
		291.2760	80.2532	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 09:55:44
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-BV06.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



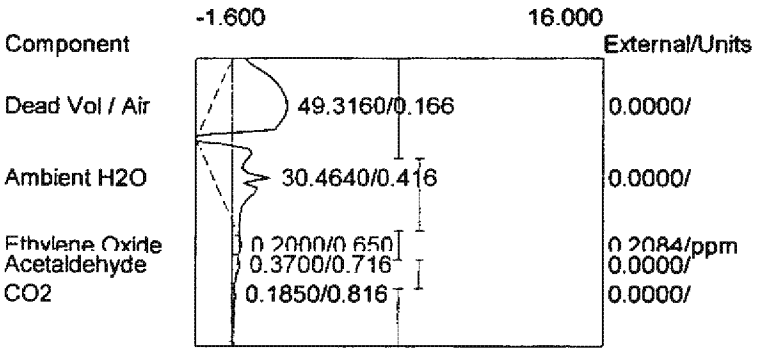
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	36.3520	0.0000	
Ambient H2O	0.400	30.0460	0.0000	
Ethylene Oxide	0.650	0.1850	0.1928	ppm
Acetaldehyde	0.716	0.3890	0.0000	
CO2	0.966	0.0170	0.0000	
		66.9890	0.1928	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 09:55:44
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-BV06.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



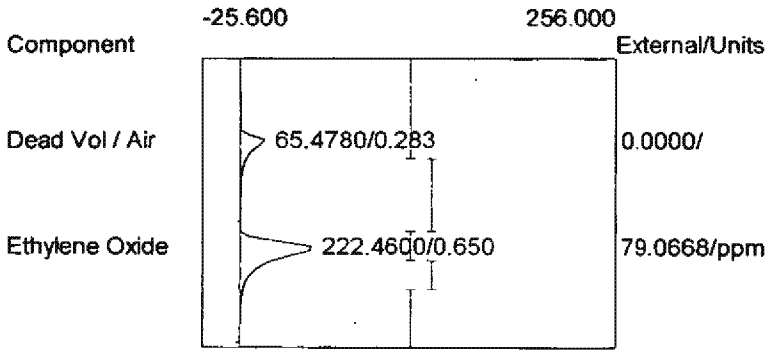
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	64.6380	0.0000	
Ethylene Oxide	0.650	220.3130	78.3037	ppm
		284.9510	78.3037	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 09:57:18
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-BV07.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



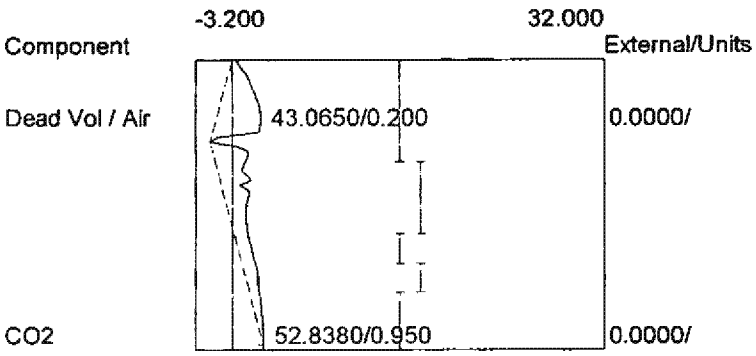
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	49.3160	0.0000	
Ambient H2O	0.416	30.4640	0.0000	
Ethylene Oxide	0.650	0.2000	0.2084	ppm
Acetaldehyde	0.716	0.3700	0.0000	
CO2	0.816	0.1850	0.0000	
		80.5350	0.2084	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 09:57:18
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-BV07.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



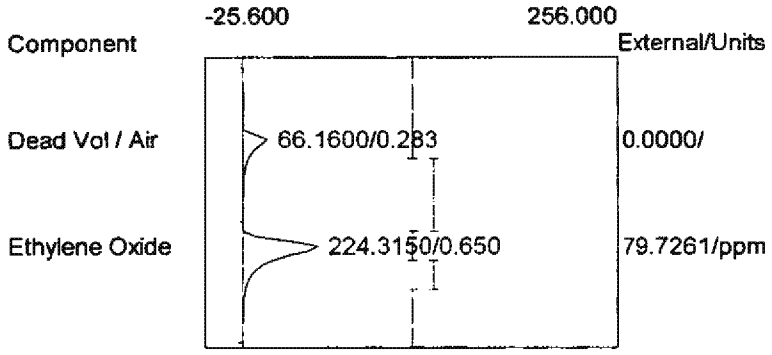
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.4780	0.0000	
Ethylene Oxide	0.650	222.4600	79.0668	ppm
		287.9380	79.0668	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 09:58:45
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-BV08.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



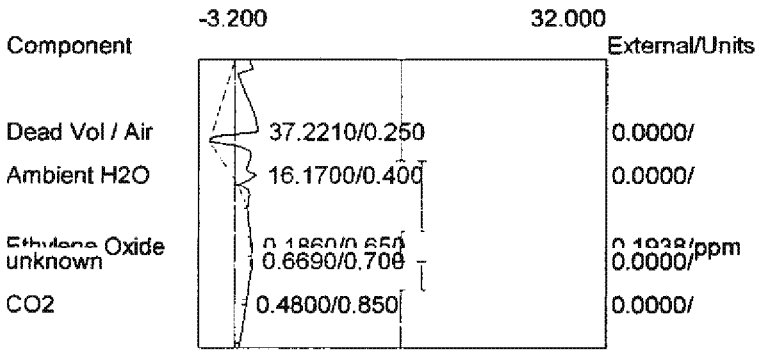
Component	Retention	Area	External	Units
Dead Vol / Air	0.200	43.0650	0.0000	
CO2	0.950	52.8380	0.0000	
		95.9030	0.0000	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 09:58:45
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-BV08.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



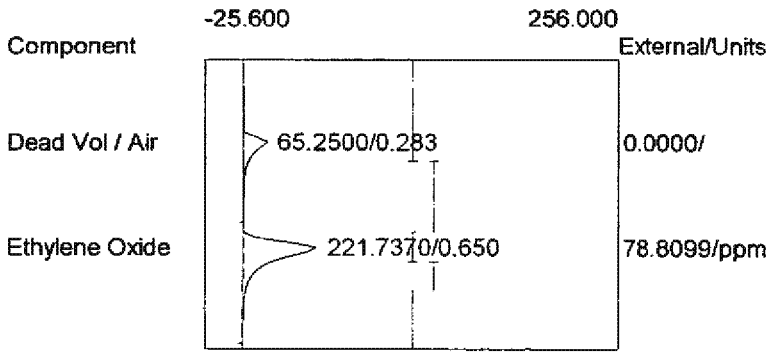
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	66.1600	0.0000	
Ethylene Oxide	0.650	224.3150	79.7261	ppm
		290.4750	79.7261	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 10:00:16
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-BV09.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



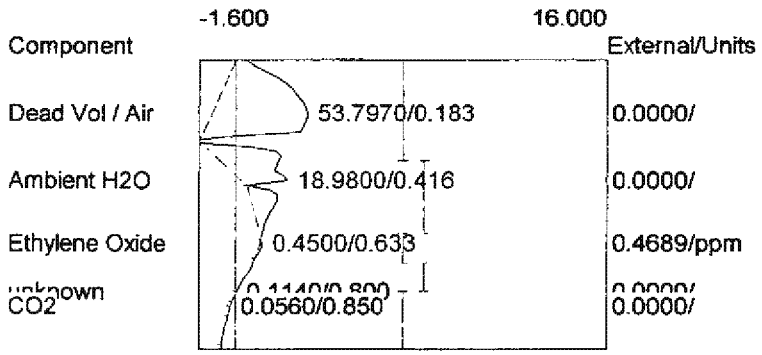
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	37.2210	0.0000	
Ambient H2O	0.400	16.1700	0.0000	
Ethylene Oxide	0.650	0.1860	0.1938	ppm
CO2	0.850	0.4800	0.0000	
		54.0570	0.1938	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 10:00:16
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-BV09.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



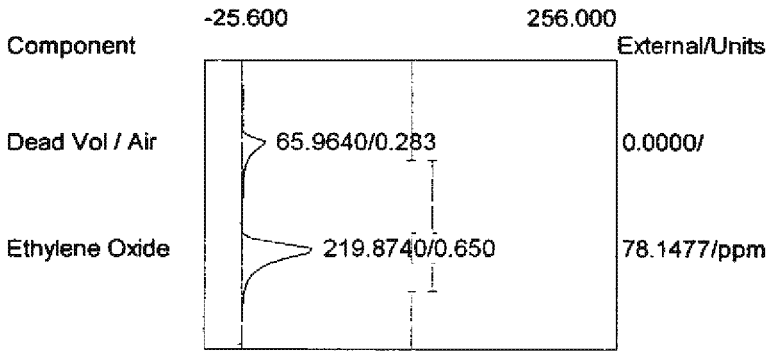
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.2500	0.0000	
Ethylene Oxide	0.650	221.7370	78.8099	ppm
		286.9870	78.8099	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 10:01:48
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-BV10.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.183	53.7970	0.0000	
Ambient H2O	0.416	18.9800	0.0000	
Ethylene Oxide	0.633	0.4500	0.4689	ppm
CO2	0.850	0.0560	0.0000	
		73.2830	0.4689	

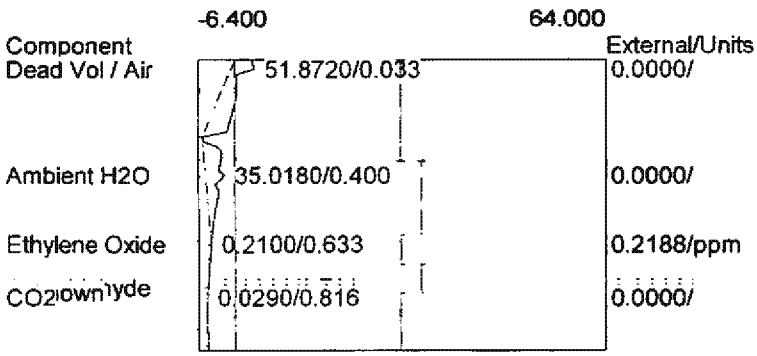
Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 10:01:48
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-BV10.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer

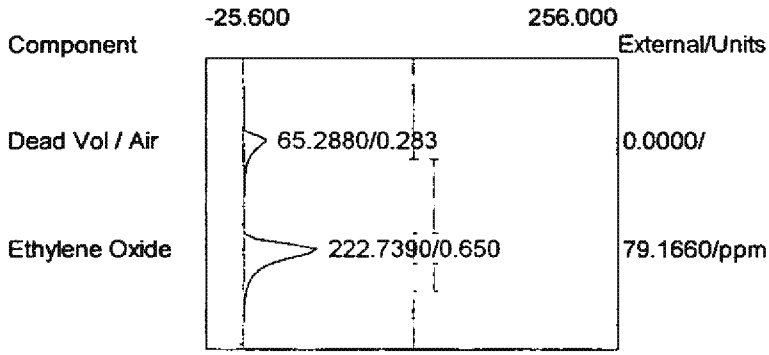


Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.9640	0.0000	
Ethylene Oxide	0.650	219.8740	78.1477	ppm
		285.8380	78.1477	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 10:03:23
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-BV11.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3BV
Analysis date: 06/21/2005 10:03:23
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-BV11.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer





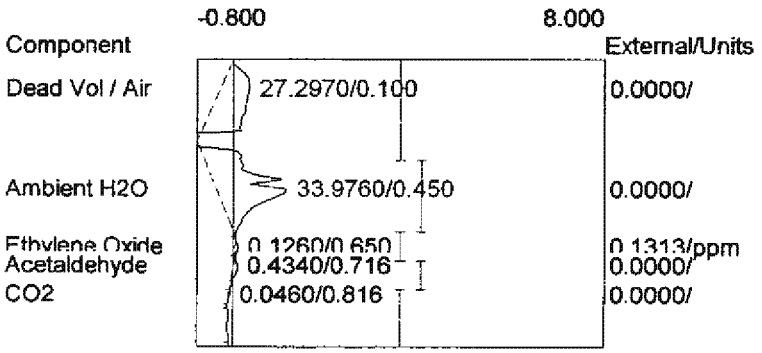
Component	Retention	Area	External	Units
Dead Vol / Air	0.033	51.8720	0.0000	
Ambient H2O	0.400	35.0180	0.0000	
Ethylene Oxide	0.633	0.2100	0.2188	ppm
Acetaldehyde	0.783	0.0200	0.0000	
CO2	0.816	0.0290	0.0000	
		87.1490	0.2188	

Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.2880	0.0000	
Ethylene Oxide	0.650	222.7390	79.1660	ppm
		288.0270	79.1660	

APPENDIX E

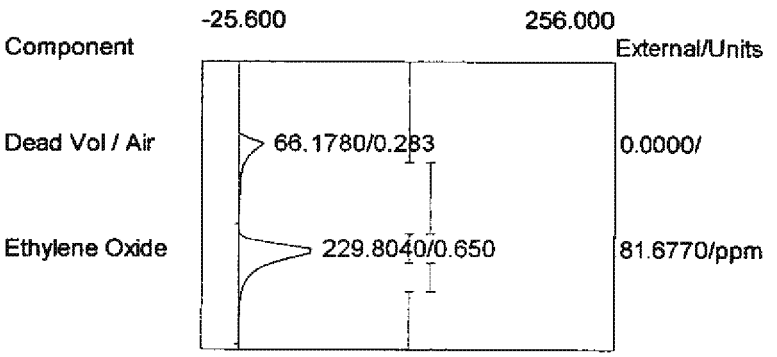
Run #1 Chromatograms – Exhaust Phase

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 10:55:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-Exh01.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



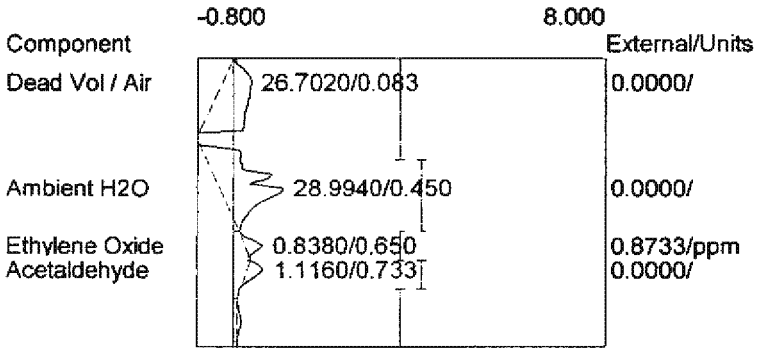
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	27.2970	0.0000	
Ambient H2O	0.450	33.9760	0.0000	
Ethylene Oxide	0.650	0.1260	0.1313	ppm
Acetaldehyde	0.716	0.4340	0.0000	
CO2	0.816	0.0460	0.0000	
		61.8790	0.1313	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 10:55:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-Exh01.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



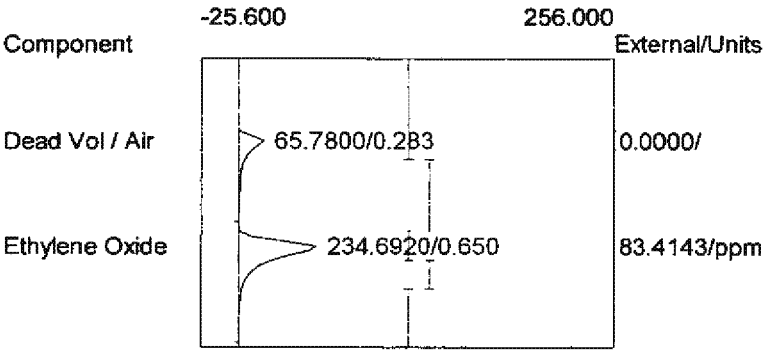
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	66.1780	0.0000	
Ethylene Oxide	0.650	229.8040	81.6770	ppm
		295.9820	81.6770	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 10:56:16
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-Exh02.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



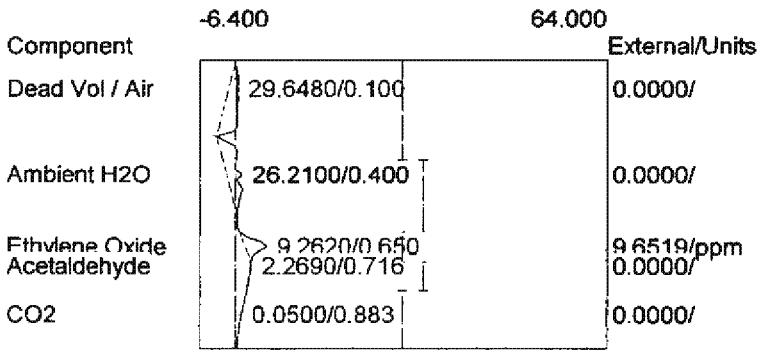
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	26.7020	0.0000	
Ambient H2O	0.450	28.9940	0.0000	
Ethylene Oxide	0.650	0.8380	0.8733	ppm
Acetaldehyde	0.733	1.1160	0.0000	
		57.6500	0.8733	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 10:56:16
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-Exh02.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



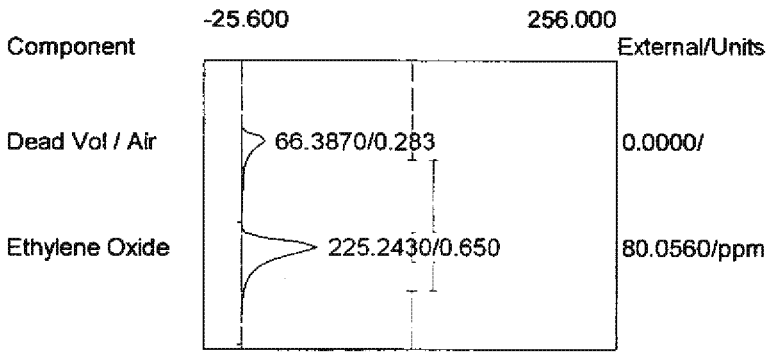
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.7800	0.0000	
Ethylene Oxide	0.650	234.6920	83.4143	ppm
		300.4720	83.4143	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 10:57:29
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-Exh03.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



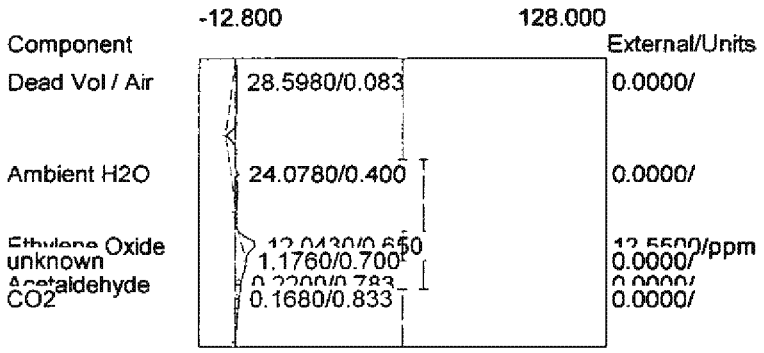
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	29.6480	0.0000	
Ambient H2O	0.400	26.2100	0.0000	
Ethylene Oxide	0.650	9.2620	9.6519	ppm
Acetaldehyde	0.716	2.2690	0.0000	
CO2	0.883	0.0500	0.0000	
		67.4390	9.6519	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 10:57:29
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-Exh03.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



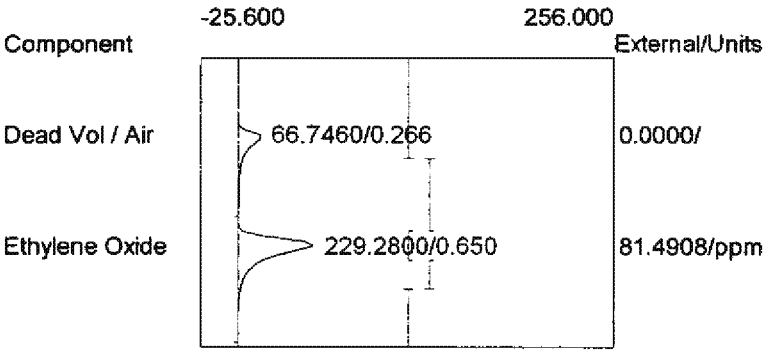
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	66.3870	0.0000	
Ethylene Oxide	0.650	225.2430	80.0560	ppm
		291.6300	80.0560	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 10:58:45
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-Exh04.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



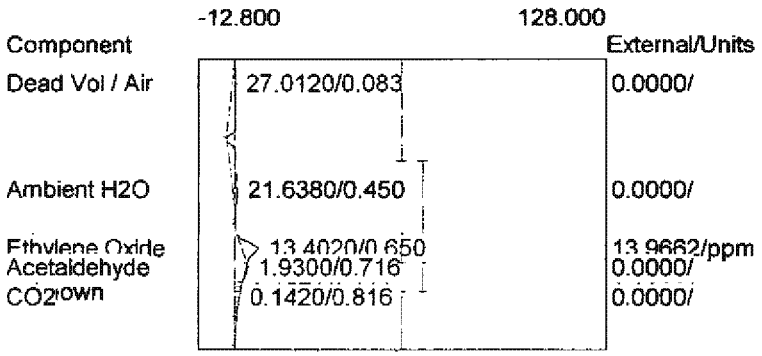
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	28.5980	0.0000	
Ambient H2O	0.400	24.0780	0.0000	
Ethylene Oxide	0.650	12.0430	12.5500	ppm
Acetaldehyde	0.783	0.2200	0.0000	
CO2	0.833	0.1680	0.0000	
		65.1070	12.5500	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 10:58:45
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-Exh04.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



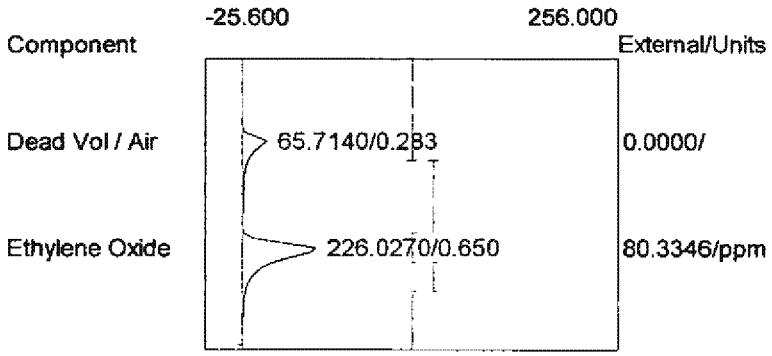
Component	Retention	Area	External	Unit
Dead Vol / Air	0.266	66.7460	0.0000	
Ethylene Oxide	0.650	229.2800	81.4908	ppm
		296.0260	81.4908	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:00:00
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-Exh05.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



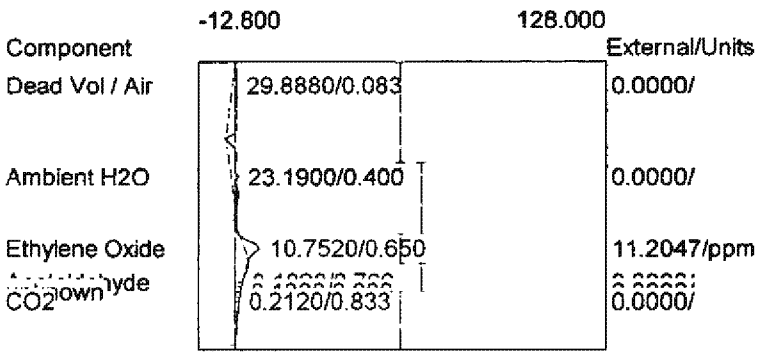
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	27.0120	0.0000	
Ambient H2O	0.450	21.6380	0.0000	
Ethylene Oxide	0.650	13.4020	13.9662	ppm
Acetaldehyde	0.716	1.9300	0.0000	
CO2	0.816	0.1420	0.0000	
		64.1240	13.9662	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:00:00
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-Exh05.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



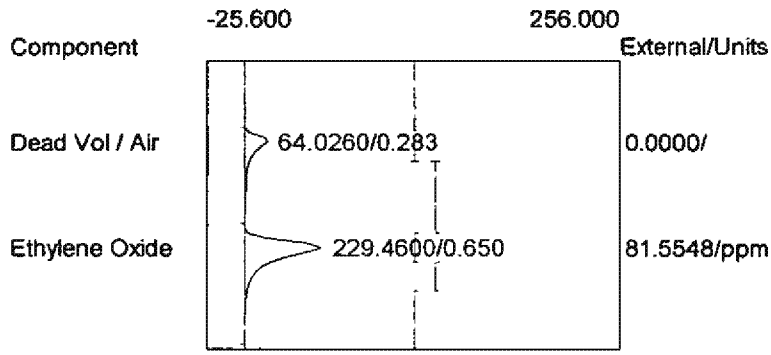
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.7140	0.0000	
Ethylene Oxide	0.650	226.0270	80.3346	ppm
		291.7410	80.3346	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:01:15
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-Exh06.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



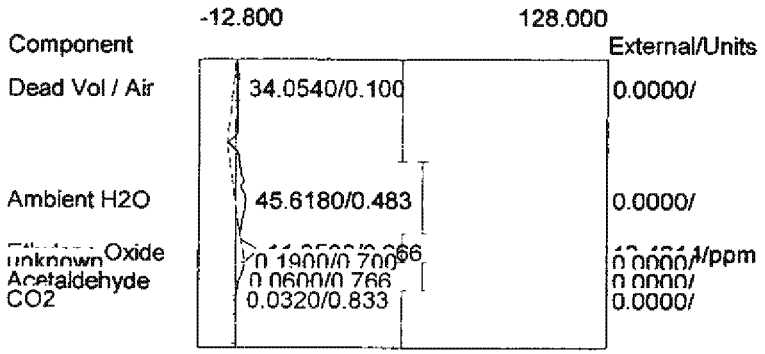
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	29.8880	0.0000	
Ambient H2O	0.400	23.1900	0.0000	
Ethylene Oxide	0.650	10.7520	11.2047	ppm
Acetaldehyde	0.766	0.1820	0.0000	
CO2	0.833	0.2120	0.0000	
		64.2240	11.2047	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:01:15
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-Exh06.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



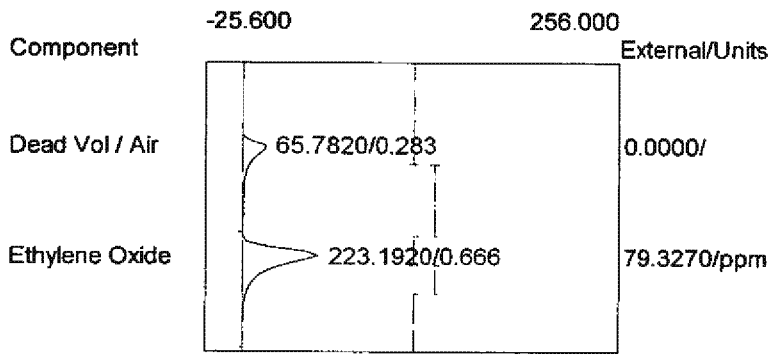
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	64.0260	0.0000	
Ethylene Oxide	0.650	229.4600	81.5548	ppm
		293.4860	81.5548	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:02:45
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-Exh07.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



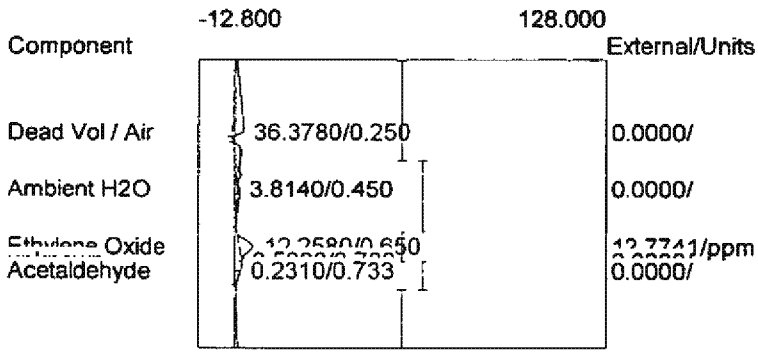
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	34.0540	0.0000	
Ambient H2O	0.483	45.6180	0.0000	
Ethylene Oxide	0.666	11.9580	12.4614	ppm
Acetaldehyde	0.766	0.0600	0.0000	
CO2	0.833	0.0320	0.0000	
		91.7220	12.4614	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:02:45
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-Exh07.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



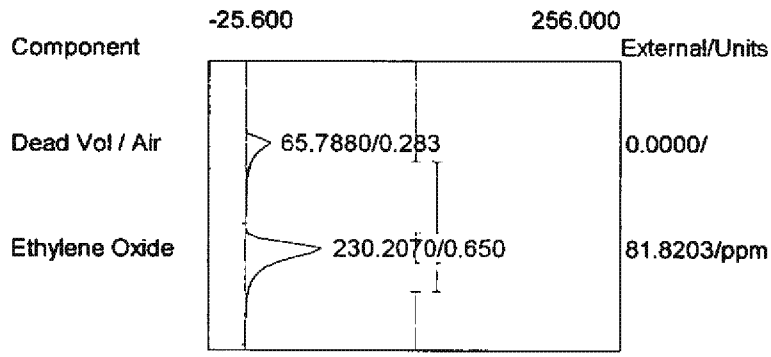
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.7820	0.0000	
Ethylene Oxide	0.666	223.1920	79.3270	ppm
		288.9740	79.3270	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:04:14
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-Exh08.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



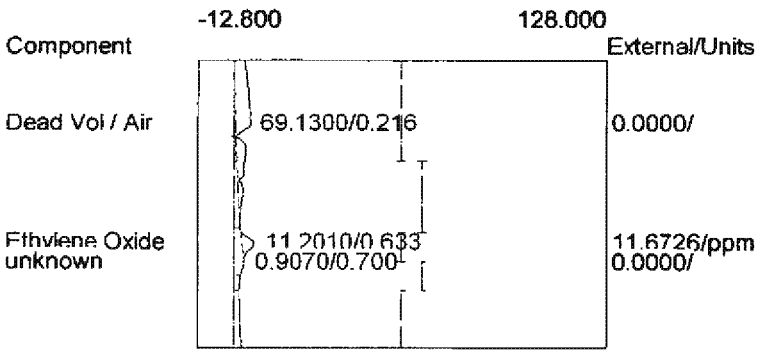
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	36.3780	0.0000	
Ambient H2O	0.450	3.8140	0.0000	
Ethylene Oxide	0.650	12.2580	12.7741	ppm
Acetaldehyde	0.733	0.2310	0.0000	
		52.6810	12.7741	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:04:14
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-Exh08.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



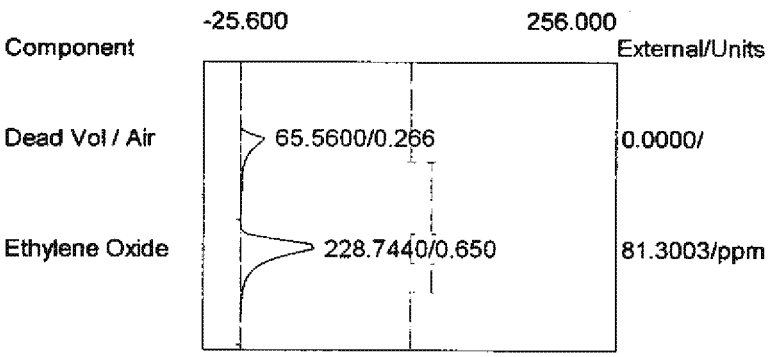
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.7880	0.0000	
Ethylene Oxide	0.650	230.2070	81.8203	ppm
		295.9950	81.8203	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:05:45
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-Exh09.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



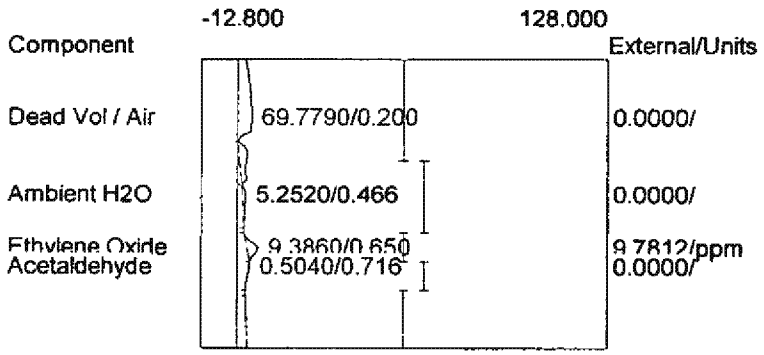
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	69.1300	0.0000	
Ethylene Oxide	0.633	11.2010	11.6726	ppm
		80.3310	11.6726	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:05:45
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-Exh09.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



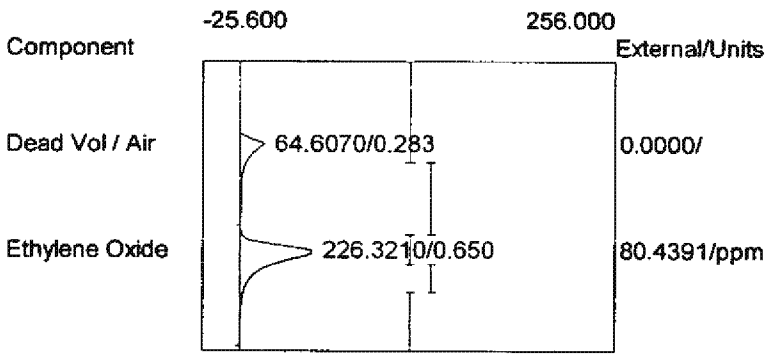
Component	Retention	Area	External	Unit
Dead Vol / Air	0.266	65.5600	0.0000	
Ethylene Oxide	0.650	228.7440	81.3003	ppm
		294.3040	81.3003	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:07:16
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-Exh10.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



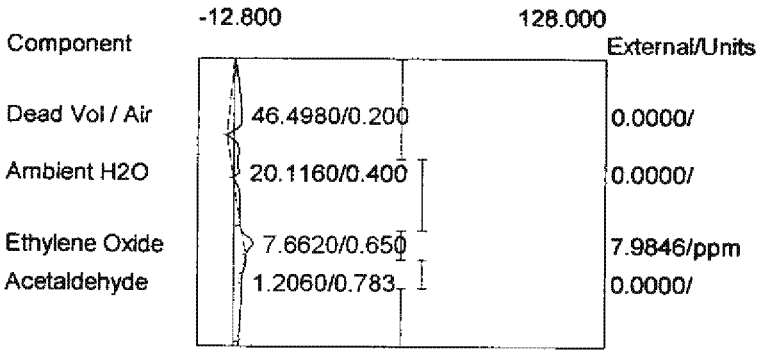
Component	Retention	Area	External	Units
Dead Vol / Air	0.200	69.7790	0.0000	
Ambient H2O	0.466	5.2520	0.0000	
Ethylene Oxide	0.650	9.3860	9.7812	ppm
Acetaldehyde	0.716	0.5040	0.0000	
		84.9210	9.7812	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:07:16
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-Exh10.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



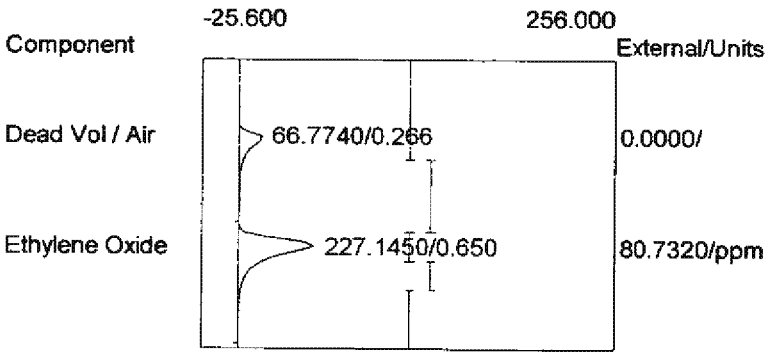
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	64.6070	0.0000	
Ethylene Oxide	0.650	226.3210	80.4391	ppm
		290.9280	80.4391	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:08:46
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-Exh11.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



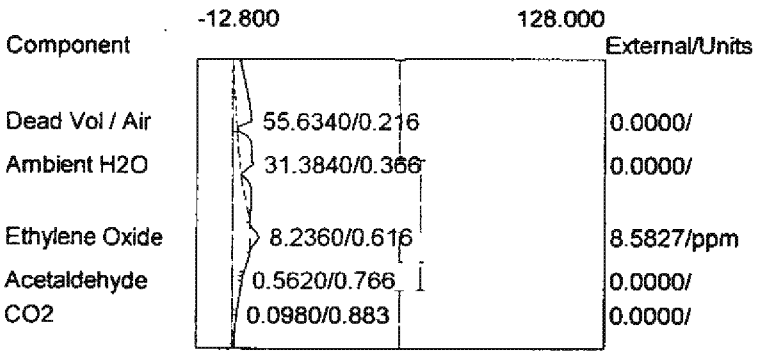
Component	Retention	Area	External	Units
Dead Vol / Air	0.200	46.4980	0.0000	
Ambient H2O	0.400	20.1160	0.0000	
Ethylene Oxide	0.650	7.6620	7.9846	ppm
Acetaldehyde	0.783	1.2060	0.0000	
		75.4820	7.9846	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:08:46
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-Exh11.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



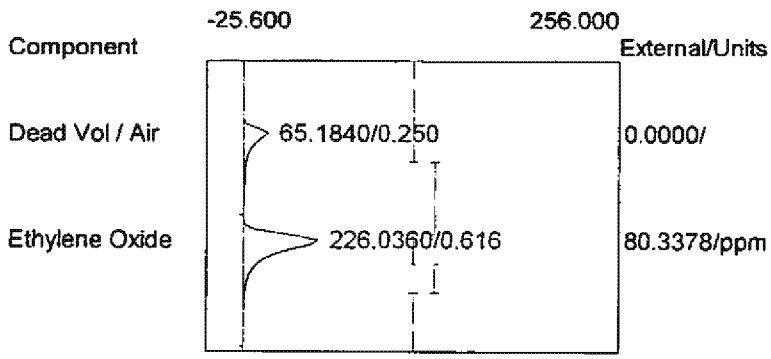
Component	Retention	Area	External	Unit
Dead Vol / Air	0.266	66.7740	0.0000	
Ethylene Oxide	0.650	227.1450	80.7320	ppm
		293.9190	80.7320	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:10:17
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-Exh12.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



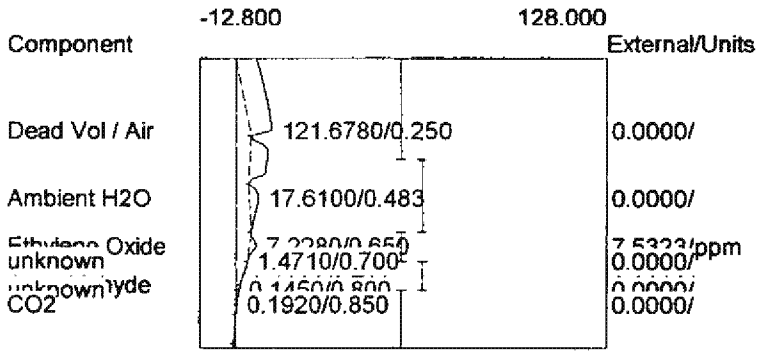
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	55.6340	0.0000	
Ambient H2O	0.366	31.3840	0.0000	
Ethylene Oxide	0.616	8.2360	8.5827	ppm
Acetaldehyde	0.766	0.5620	0.0000	
CO2	0.883	0.0980	0.0000	
		95.9140	8.5827	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:10:17
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-Exh12.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



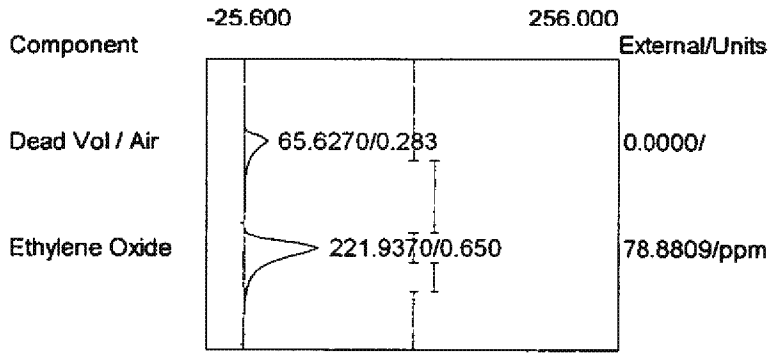
Component	Retention	Area	External	Unit
Dead Vol / Air	0.250	65.1840	0.0000	
Ethylene Oxide	0.616	226.0360	80.3378	ppm
		291.2200	80.3378	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:11:45
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-Exh13.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



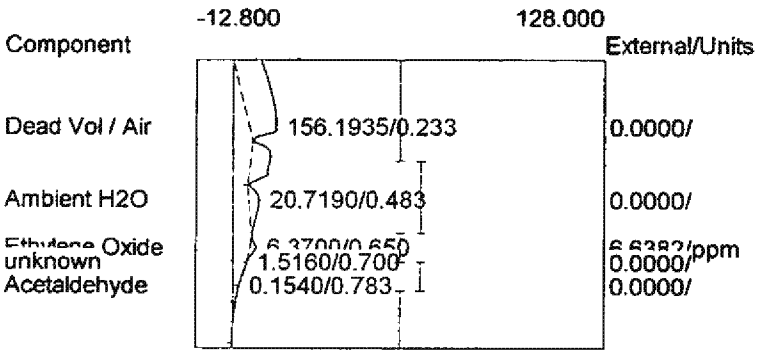
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	121.6780	0.0000	
Ambient H2O	0.483	17.6100	0.0000	
Ethylene Oxide	0.650	7.2280	7.5323	ppm
Acetaldehyde	0.783	0.1630	0.0000	
CO2	0.850	0.1920	0.0000	
		146.8710	7.5323	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:11:45
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-Exh13.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



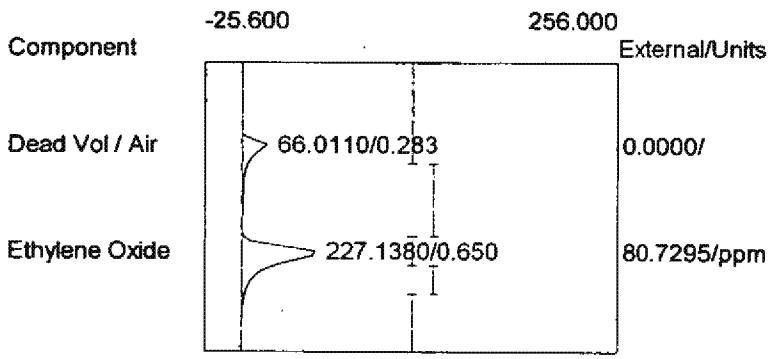
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.6270	0.0000	
Ethylene Oxide	0.650	221.9370	78.8809	ppm
		287.5640	78.8809	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:13:17
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-Exh14.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



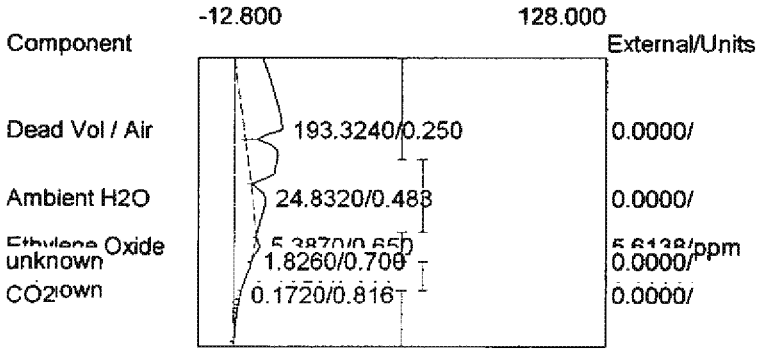
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	156.1935	0.0000	
Ambient H2O	0.483	20.7190	0.0000	
Ethylene Oxide	0.650	6.3700	6.6382	ppm
Acetaldehyde	0.783	0.1540	0.0000	
		183.4365	6.6382	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:13:17
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-Exh14.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



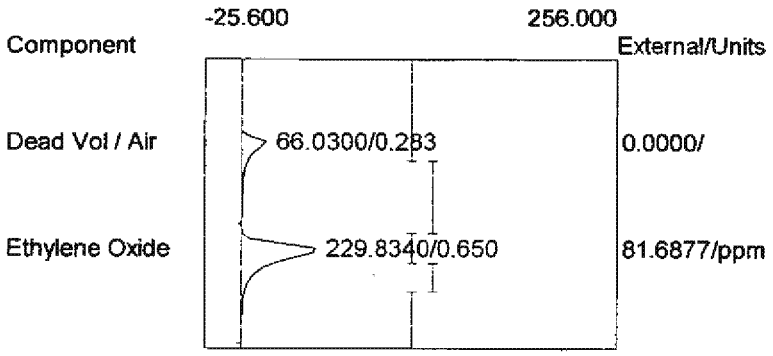
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	66.0110	0.0000	
Ethylene Oxide	0.650	227.1380	80.7295	ppm
		293.1490	80.7295	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:14:45
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-Exh15.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



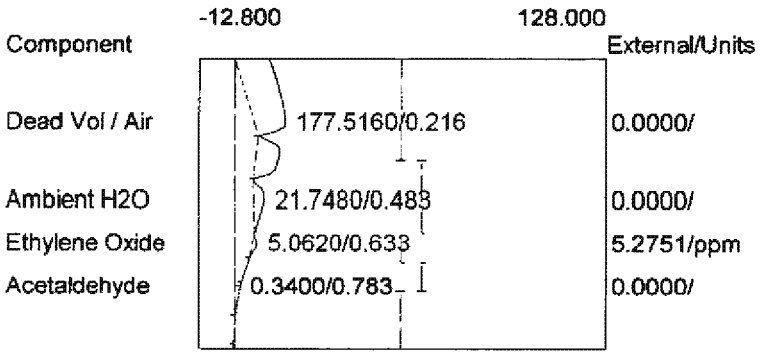
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	193.3240	0.0000	
Ambient H2O	0.483	24.8320	0.0000	
Ethylene Oxide	0.650	5.3870	5.6138	ppm
CO2	0.816	0.1720	0.0000	
		223.7150	5.6138	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:14:45
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-Exh15.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



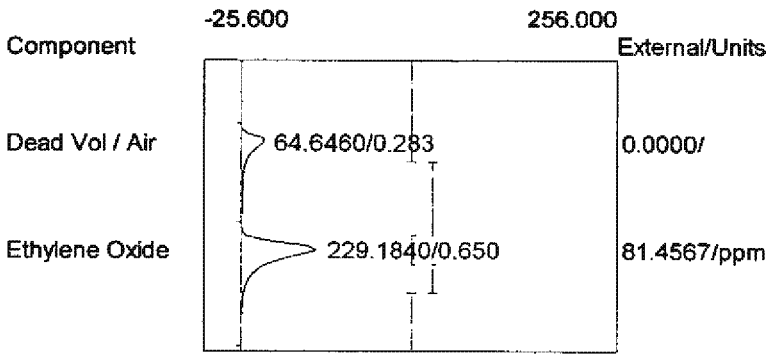
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	66.0300	0.0000	
Ethylene Oxide	0.650	229.8340	81.6877	ppm
		295.8640	81.6877	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:16:16
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB1-Exh16.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.216	177.5160	0.0000	
Ambient H2O	0.483	21.7480	0.0000	
Ethylene Oxide	0.633	5.0620	5.2751	ppm
Acetaldehyde	0.783	0.3400	0.0000	
		204.6660	5.2751	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#1Exh
Analysis date: 06/21/2005 11:16:16
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB1-Exh16.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer

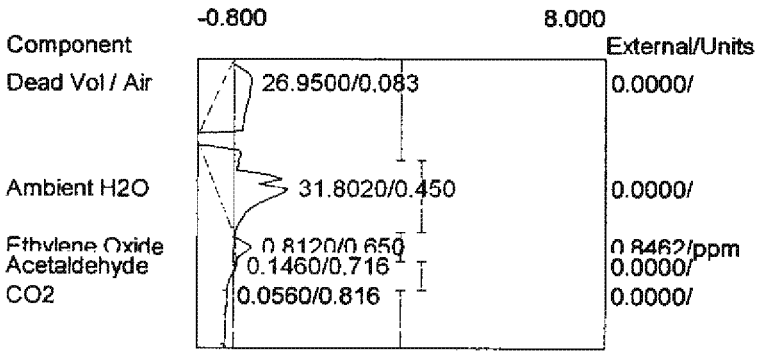


Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	64.6460	0.0000	
Ethylene Oxide	0.650	229.1840	81.4567	ppm
		293.8300	81.4567	

APPENDIX F

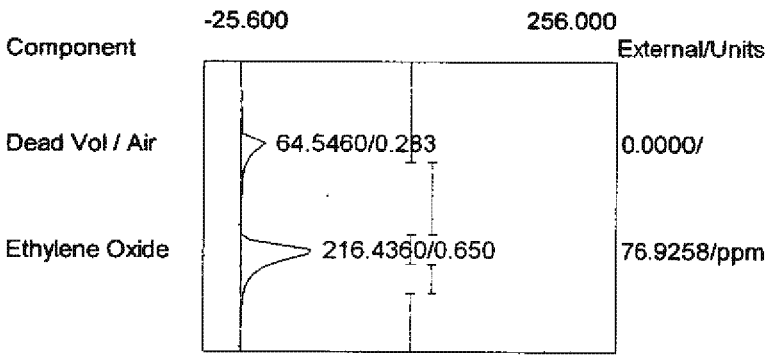
Run #2 Chromatograms – Exhaust Phase

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 11:50:03
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-Exh01.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	26.9500	0.0000	
Ambient H2O	0.450	31.8020	0.0000	
Ethylene Oxide	0.650	0.8120	0.8462	ppm
Acetaldehyde	0.716	0.1460	0.0000	
CO2	0.816	0.0560	0.0000	
		59.7660	0.8462	

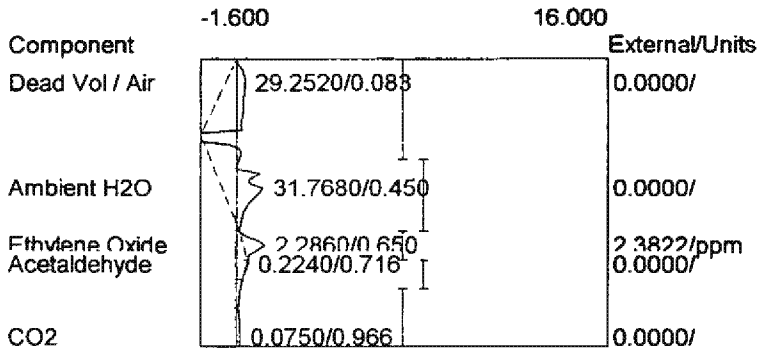
Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 11:50:03
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-Exh01.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer

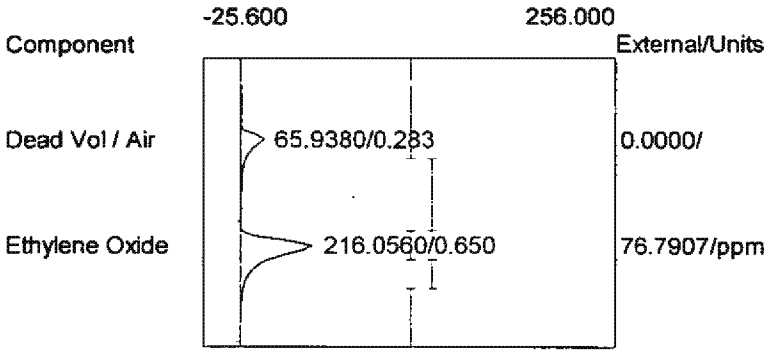


Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	64.5460	0.0000	
Ethylene Oxide	0.650	216.4360	76.9258	ppm
		280.9820	76.9258	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 11:51:16
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-Exh02.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 11:51:16
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-Exh02.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer

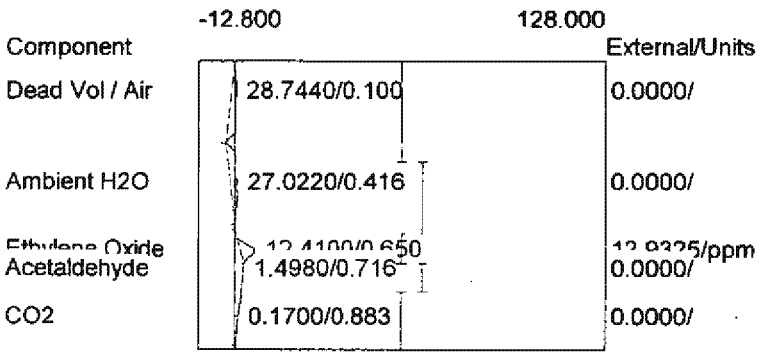




Component	Retention	Area	External	Units
Dead Vol / Air	0.083	29.2520	0.0000	
Ambient H2O	0.450	31.7680	0.0000	
Ethylene Oxide	0.650	2.2860	2.3822	ppm
Acetaldehyde	0.716	0.2240	0.0000	
CO2	0.966	0.0750	0.0000	
		63.6050	2.3822	

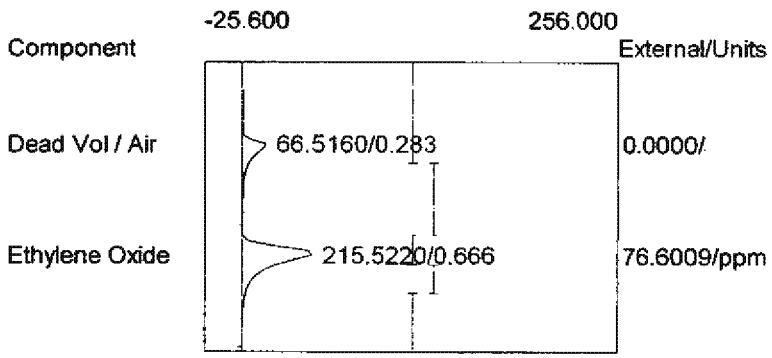
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.9380	0.0000	
Ethylene Oxide	0.650	216.0560	76.7907	ppm
		281.9940	76.7907	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 11:52:30
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-Exh03.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



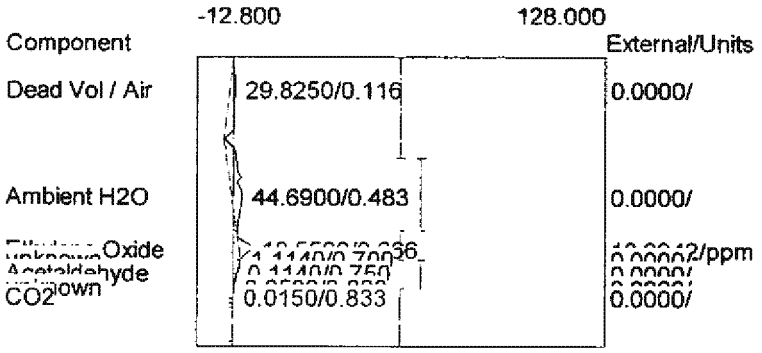
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	28.7440	0.0000	
Ambient H2O	0.416	27.0220	0.0000	
Ethylene Oxide	0.650	12.4100	12.9325	ppm
Acetaldehyde	0.716	1.4980	0.0000	
CO2	0.883	0.1700	0.0000	
		69.8440	12.9325	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 11:52:30
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-Exh03.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



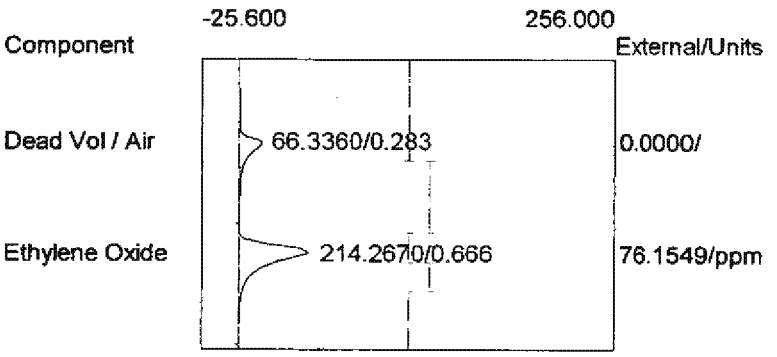
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	66.5160	0.0000	
Ethylene Oxide	0.666	215.5220	76.6009	ppm
		282.0380	76.6009	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 11:54:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-Exh04.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



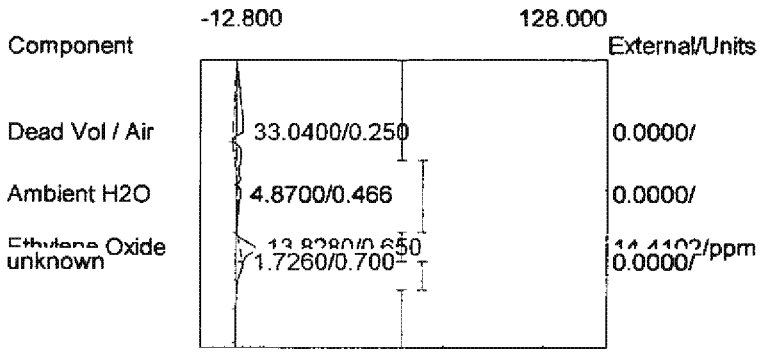
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	29.8250	0.0000	
Ambient H2O	0.483	44.6900	0.0000	
Ethylene Oxide	0.666	10.5500	10.9942	ppm
Acetaldehyde	0.750	0.1140	0.0000	
CO2	0.833	0.0150	0.0000	
		85.1940	10.9942	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 11:54:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-Exh04.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



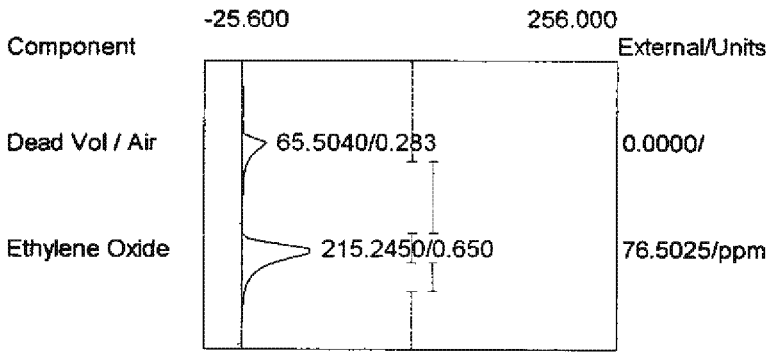
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	66.3360	0.0000	
Ethylene Oxide	0.666	214.2670	76.1549	ppm
		280.6030	76.1549	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 11:55:29
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-Exh05.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



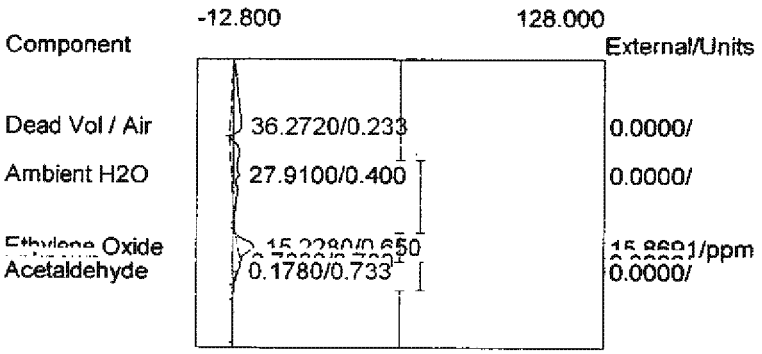
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	33.0400	0.0000	
Ambient H2O	0.466	4.8700	0.0000	
Ethylene Oxide	0.650	13.8280	14.4102	ppm
		51.7380	14.4102	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 11:55:29
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-Exh05.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



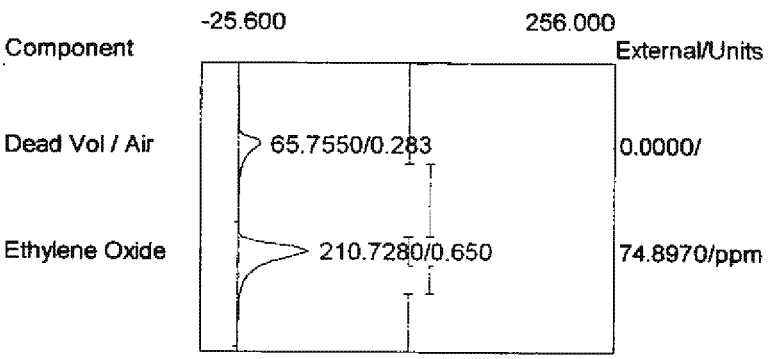
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.5040	0.0000	
Ethylene Oxide	0.650	215.2450	76.5025	ppm
		280.7490	76.5025	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 11:57:00
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-Exh06.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



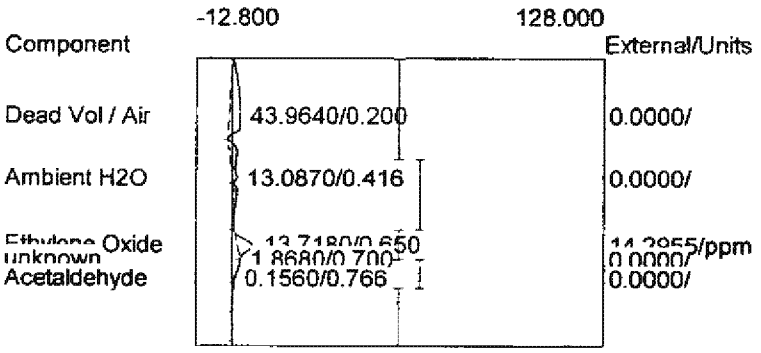
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	36.2720	0.0000	
Ambient H2O	0.400	27.9100	0.0000	
Ethylene Oxide	0.650	15.2280	15.8691	ppm
Acetaldehyde	0.733	0.1780	0.0000	
		79.5880	15.8691	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 11:57:00
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-Exh06.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



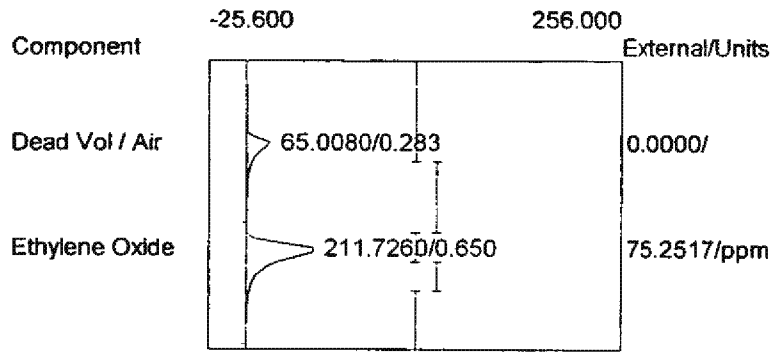
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.7550	0.0000	
Ethylene Oxide	0.650	210.7280	74.8970	ppm
		276.4830	74.8970	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 11:58:30
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-Exh07.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



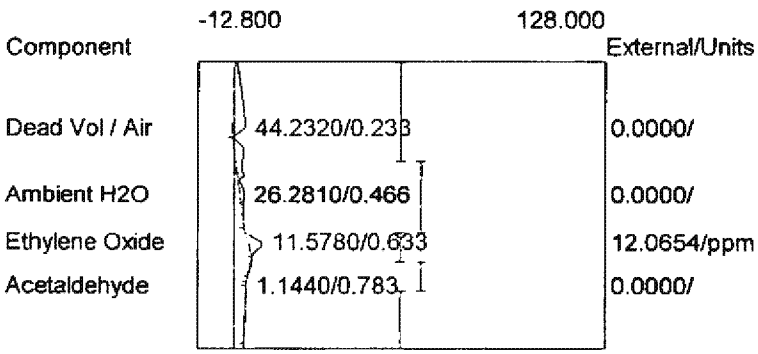
Component	Retention	Area	External	Units
Dead Vol / Air	0.200	43.9640	0.0000	
Ambient H2O	0.416	13.0870	0.0000	
Ethylene Oxide	0.650	13.7180	14.2955	ppm
Acetaldehyde	0.766	0.1560	0.0000	
		70.9250	14.2955	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 11:58:30
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-Exh07.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



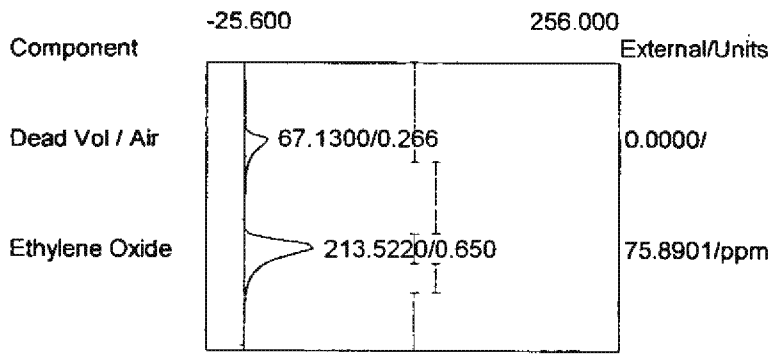
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.0080	0.0000	
Ethylene Oxide	0.650	211.7260	75.2517	ppm
		276.7340	75.2517	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 12:00:00
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-Exh08.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



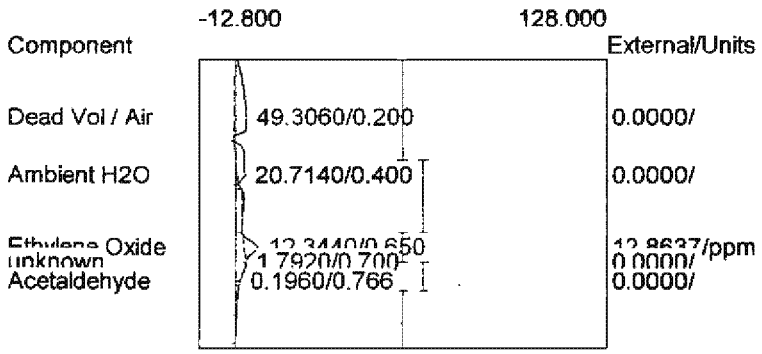
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	44.2320	0.0000	
Ambient H2O	0.466	26.2810	0.0000	
Ethylene Oxide	0.633	11.5780	12.0654	ppm
Acetaldehyde	0.783	1.1440	0.0000	
		83.2350	12.0654	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 12:00:00
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-Exh08.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



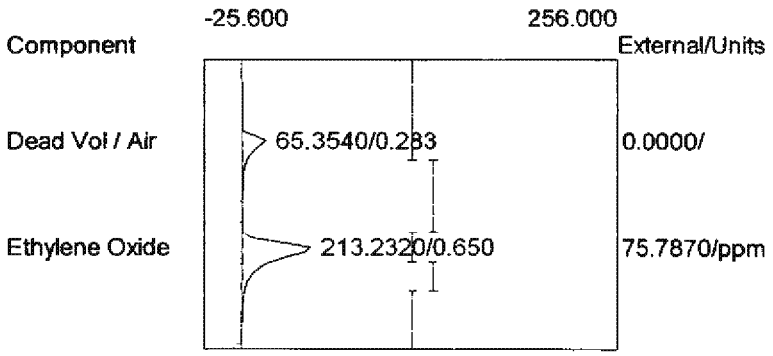
Component	Retention	Area	External	Unit
Dead Vol / Air	0.266	67.1300	0.0000	
Ethylene Oxide	0.650	213.5220	75.8901	ppm
		280.6520	75.8901	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 12:01:33
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-Exh09.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



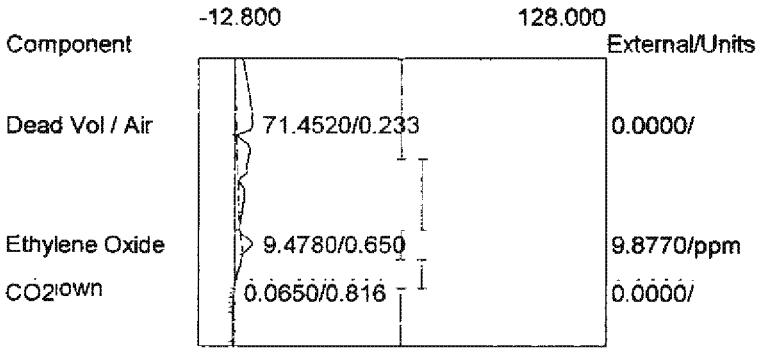
Component	Retention	Area	External	Units
Dead Vol / Air	0.200	49.3060	0.0000	
Ambient H2O	0.400	20.7140	0.0000	
Ethylene Oxide	0.650	12.3440	12.8637	ppm
Acetaldehyde	0.766	0.1960	0.0000	
		82.5600	12.8637	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 12:01:33
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-Exh09.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



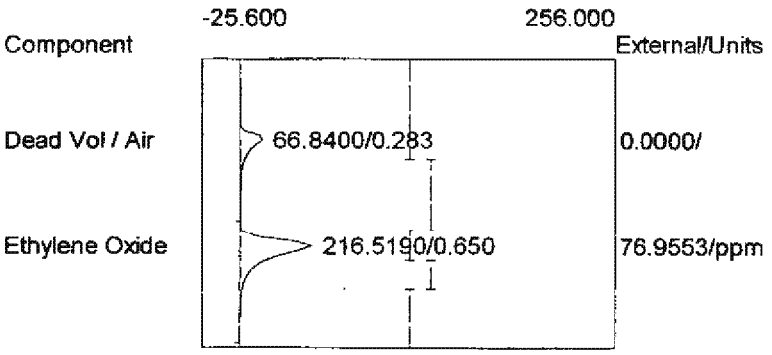
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.3540	0.0000	
Ethylene Oxide	0.650	213.2320	75.7870	ppm
		278.5860	75.7870	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 12:03:00
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-Exh10.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



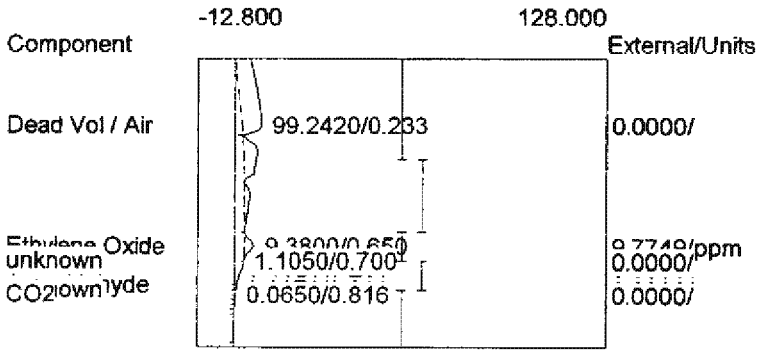
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	71.4520	0.0000	
Ethylene Oxide	0.650	9.4780	9.8770	ppm
CO2	0.816	0.0650	0.0000	
		80.9950	9.8770	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 12:03:00
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-Exh10.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



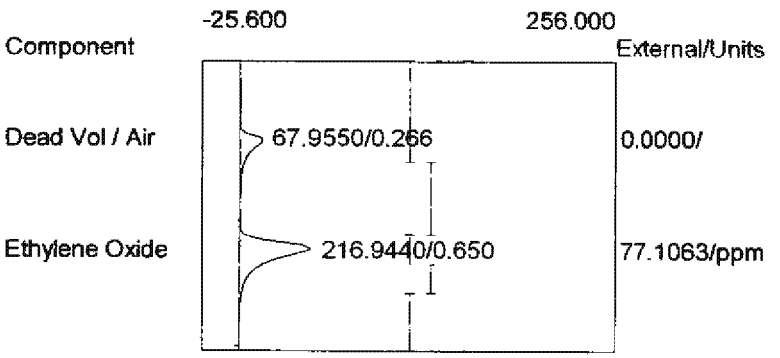
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	66.8400	0.0000	
Ethylene Oxide	0.650	216.5190	76.9553	ppm
		283.3590	76.9553	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 12:04:33
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-Exh11.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



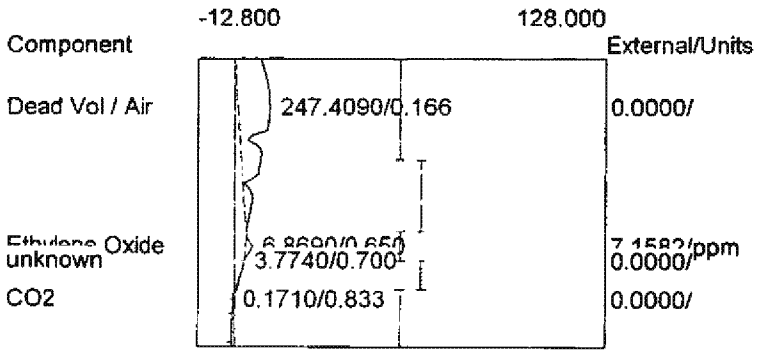
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	99.2420	0.0000	
Ethylene Oxide	0.650	9.3800	9.7749	ppm
Acetaldehyde	0.783	0.1050	0.0000	
CO2	0.816	0.0650	0.0000	
		108.7920	9.7749	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 12:04:33
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-Exh11.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



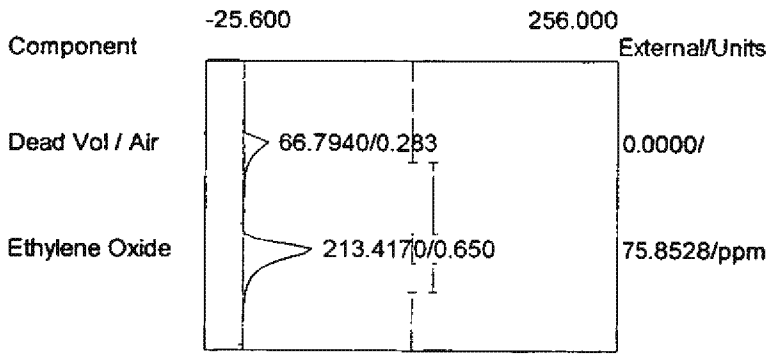
Component	Retention	Area	External	Unit
Dead Vol / Air	0.266	67.9550	0.0000	
Ethylene Oxide	0.650	216.9440	77.1063	ppm
		284.8990	77.1063	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 12:06:05
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-Exh12.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



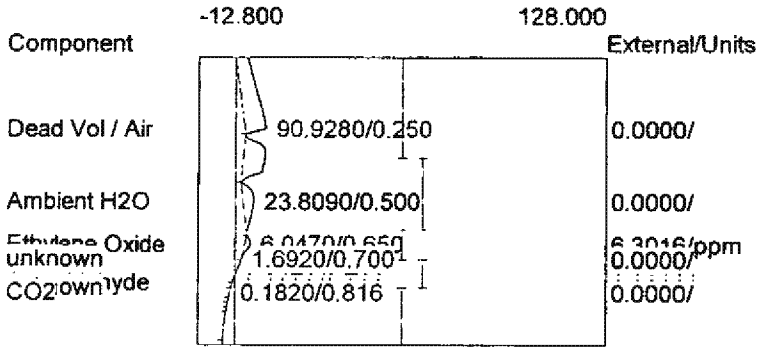
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	247.4090	0.0000	
Ethylene Oxide	0.650	6.8690	7.1582	ppm
CO2	0.833	0.1710	0.0000	
		254.4490	7.1582	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 12:06:05
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-Exh12.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



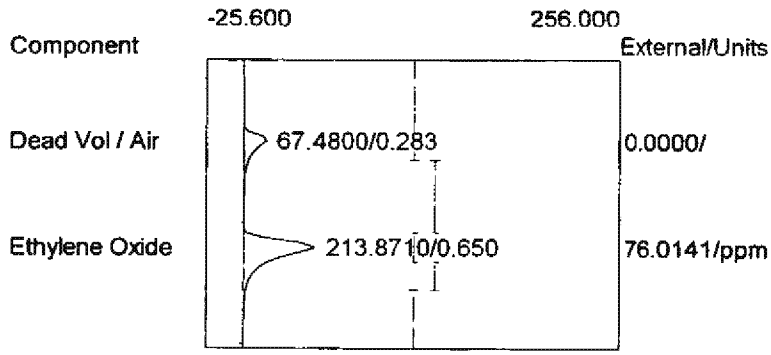
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	66.7940	0.0000	
Ethylene Oxide	0.650	213.4170	75.8528	ppm
		280.2110	75.8528	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 12:07:30
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-Exh13.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



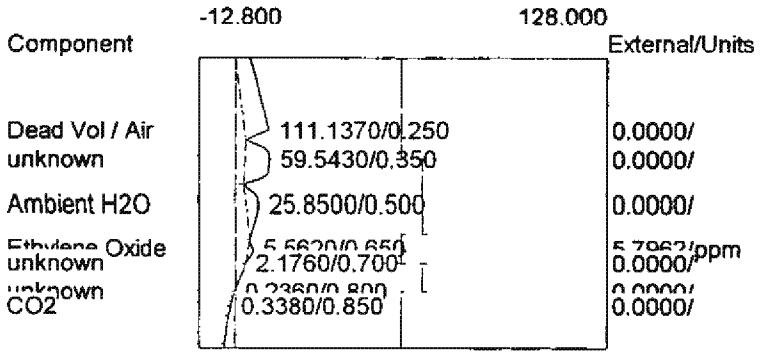
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	90.9280	0.0000	
Ambient H2O	0.500	23.8090	0.0000	
Ethylene Oxide	0.650	6.0470	6.3016	ppm
Acetaldehyde	0.783	0.2170	0.0000	
CO2	0.816	0.1820	0.0000	
		121.1830	6.3016	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 12:07:30
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-Exh13.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



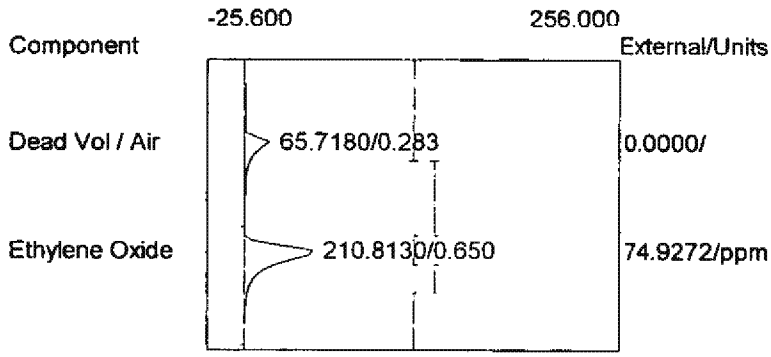
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	67.4800	0.0000	
Ethylene Oxide	0.650	213.8710	76.0141	ppm
		281.3510	76.0141	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 12:09:01
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB2-Exh14.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.250	111.1370	0.0000	
Ambient H2O	0.500	25.8500	0.0000	
Ethylene Oxide	0.650	5.5620	5.7962	ppm
CO2	0.850	0.3380	0.0000	
		142.8870	5.7962	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#2Exh
Analysis date: 06/21/2005 12:09:01
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB2-Exh14.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer

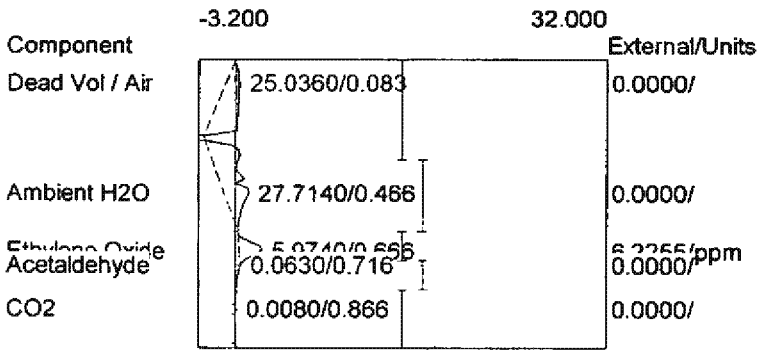


Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.7180	0.0000	
Ethylene Oxide	0.650	210.8130	74.9272	ppm
		276.5310	74.9272	

APPENDIX G

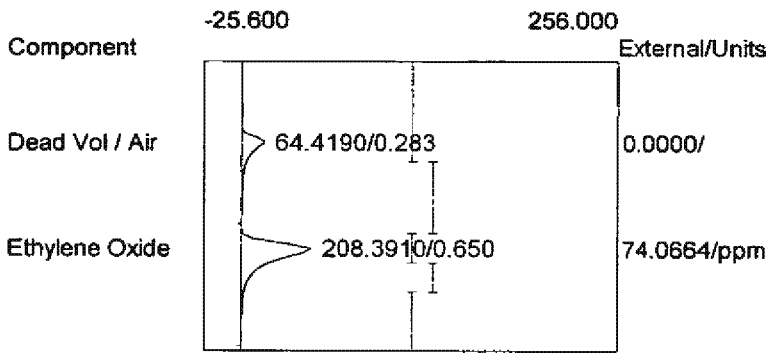
Run #3 Chromatograms – Exhaust Phase

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:16:03
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-Exh01.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



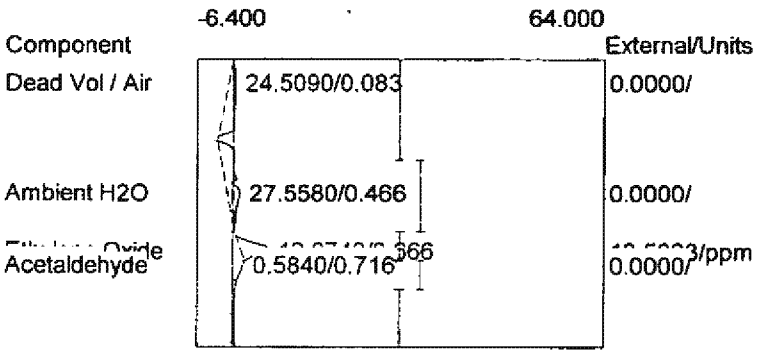
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	25.0360	0.0000	
Ambient H2O	0.466	27.7140	0.0000	
Ethylene Oxide	0.666	5.9740	6.2255	ppm
Acetaldehyde	0.716	0.0630	0.0000	
CO2	0.866	0.0080	0.0000	
		58.7950	6.2255	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:16:03
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-Exh01.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



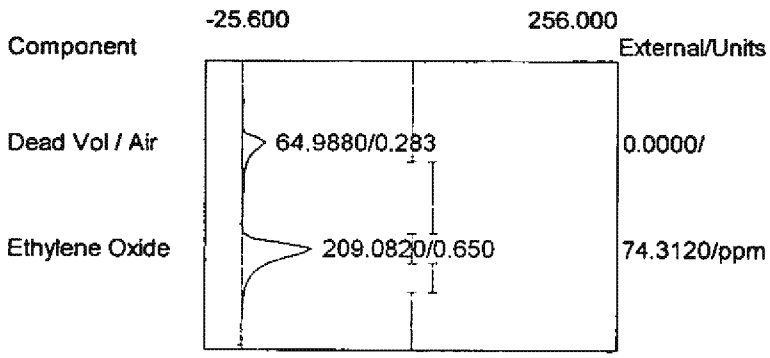
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	64.4190	0.0000	
Ethylene Oxide	0.650	208.3910	74.0664	ppm
		272.8100	74.0664	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:17:16
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-Exh02.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



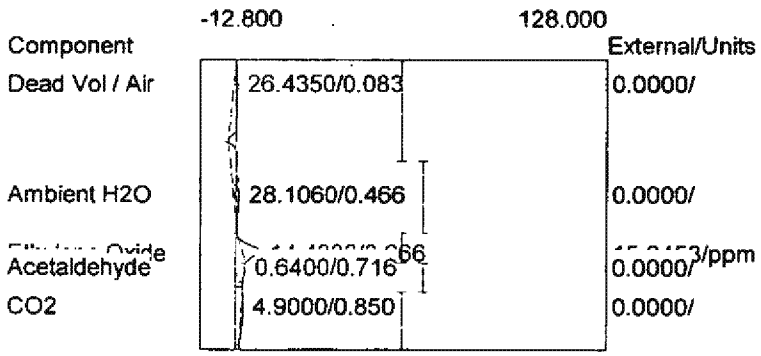
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	24.5090	0.0000	
Ambient H2O	0.466	27.5580	0.0000	
Ethylene Oxide	0.666	12.0740	12.5823	ppm
Acetaldehyde	0.716	0.5840	0.0000	
		64.7250	12.5823	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:17:16
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-Exh02.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



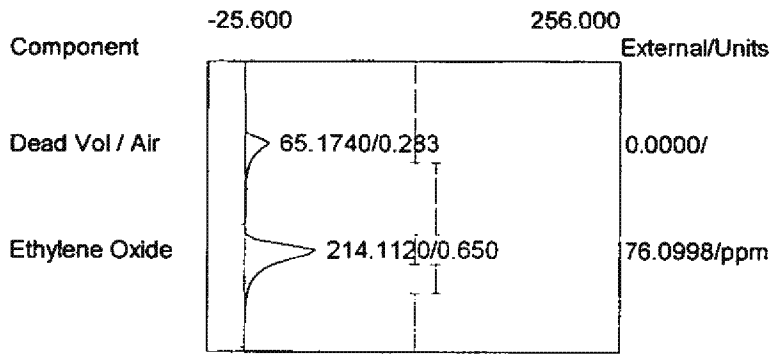
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	64.9880	0.0000	
Ethylene Oxide	0.650	209.0820	74.3120	ppm
		274.0700	74.3120	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:18:29
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-Exh03.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



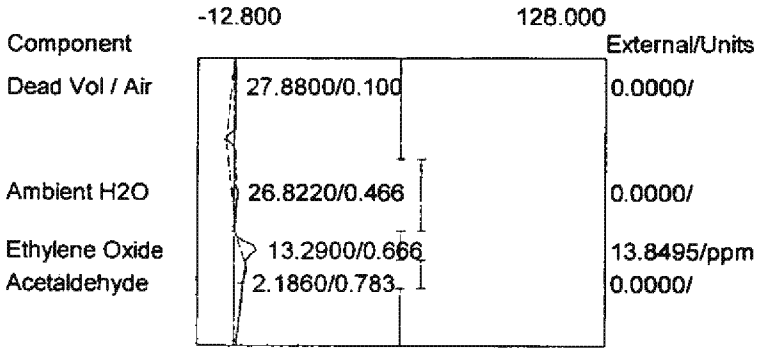
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	26.4350	0.0000	
Ambient H2O	0.466	28.1060	0.0000	
Ethylene Oxide	0.666	14.4380	15.0458	ppm
Acetaldehyde	0.716	0.6400	0.0000	
CO2	0.850	4.9000	0.0000	
		74.5190	15.0458	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:18:29
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-Exh03.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



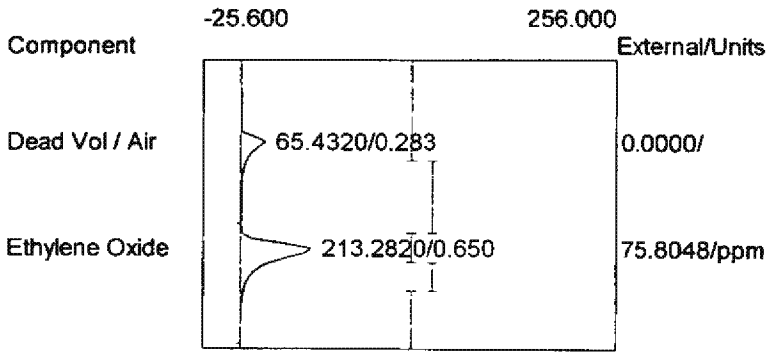
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.1740	0.0000	
Ethylene Oxide	0.650	214.1120	76.0998	ppm
		279.2860	76.0998	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:19:44
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-Exh04.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



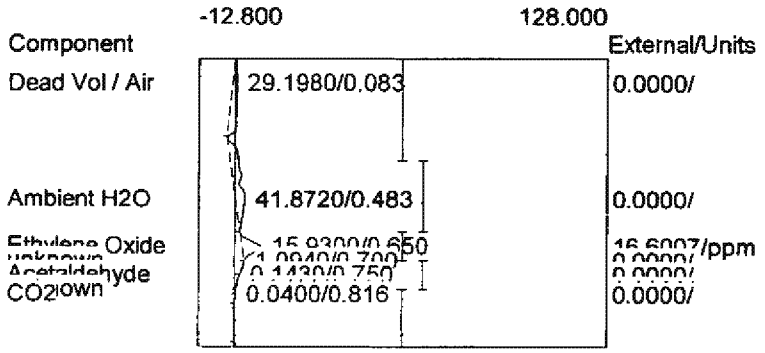
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	27.8800	0.0000	
Ambient H2O	0.466	26.8220	0.0000	
Ethylene Oxide	0.666	13.2900	13.8495	ppm
Acetaldehyde	0.783	2.1860	0.0000	
		70.1780	13.8495	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:19:44
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-Exh04.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



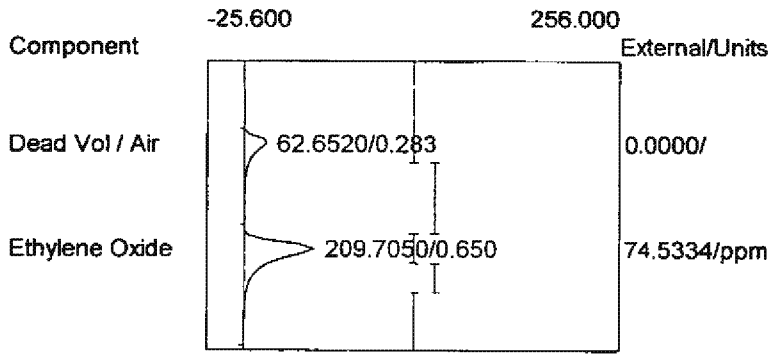
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.4320	0.0000	
Ethylene Oxide	0.650	213.2820	75.8048	ppm
		278.7140	75.8048	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:21:16
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-Exh05.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



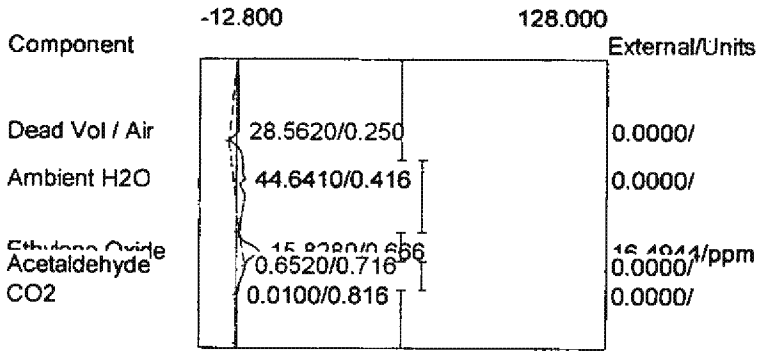
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	29.1980	0.0000	
Ambient H2O	0.483	41.8720	0.0000	
Ethylene Oxide	0.650	15.9300	16.6007	ppm
Acetaldehyde	0.750	0.1430	0.0000	
CO2	0.816	0.0400	0.0000	
		87.1830	16.6007	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:21:16
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-Exh05.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



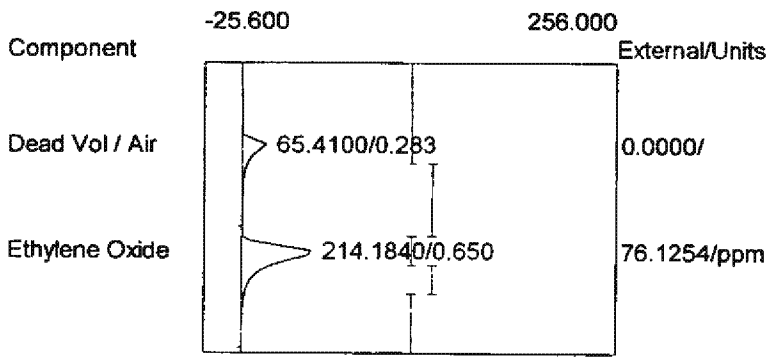
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	62.6520	0.0000	
Ethylene Oxide	0.650	209.7050	74.5334	ppm
		272.3570	74.5334	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:22:36
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-Exh06.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.250	28.5620	0.0000	
Ambient H2O	0.416	44.6410	0.0000	
Ethylene Oxide	0.666	15.8280	16.4944	ppm
Acetaldehyde	0.716	0.6520	0.0000	
CO2	0.816	0.0100	0.0000	
		89.6930	16.4944	

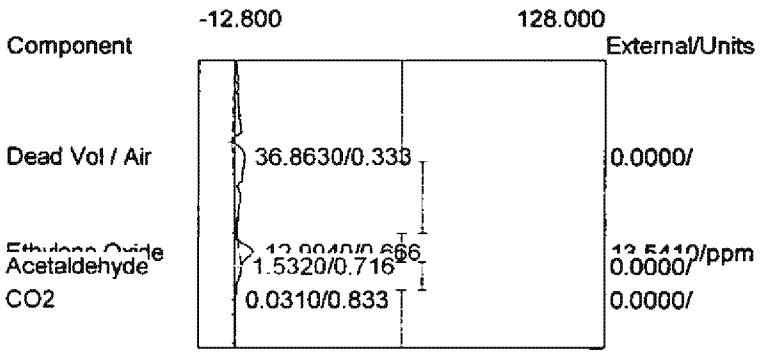
Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:22:36
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-Exh06.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer

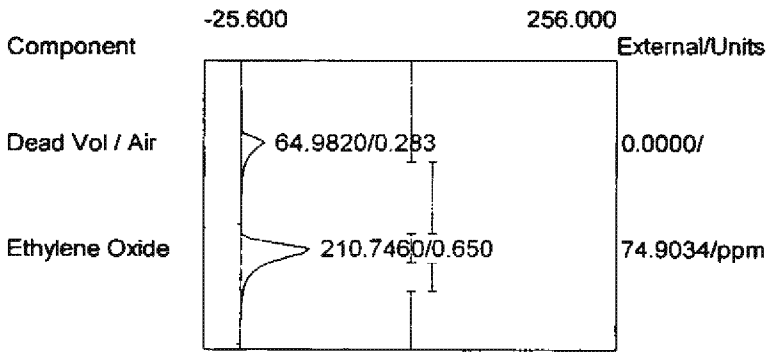


Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.4100	0.0000	
Ethylene Oxide	0.650	214.1840	76.1254	ppm
		279.5940	76.1254	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:24:15
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-Exh07.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:24:15
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-Exh07.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer

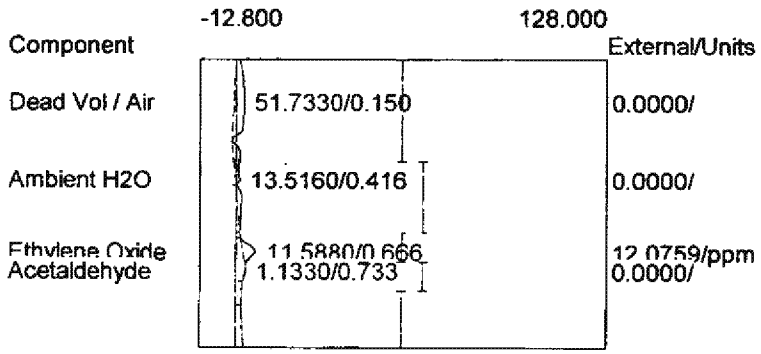




Component	Retention	Area	External	Units
Dead Vol / Air	0.333	36.8630	0.0000	
Ethylene Oxide	0.666	12.9940	13.5410	ppm
Acetaldehyde	0.716	1.5320	0.0000	
CO2	0.833	0.0310	0.0000	
		51.4200	13.5410	

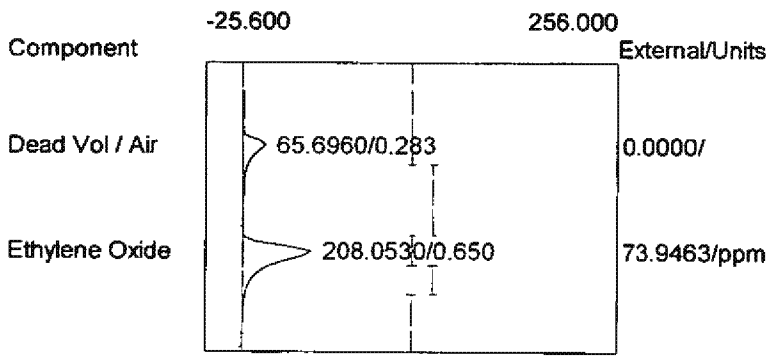
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	64.9820	0.0000	
Ethylene Oxide	0.650	210.7460	74.9034	ppm
		275.7280	74.9034	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:25:44
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-Exh08.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



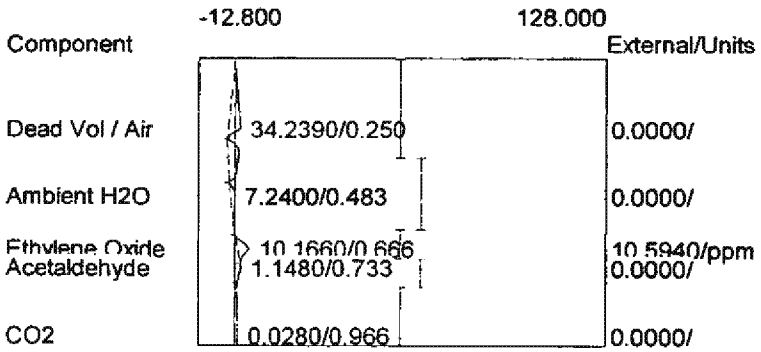
Component	Retention	Area	External	Units
Dead Vol / Air	0.150	51.7330	0.0000	
Ambient H2O	0.416	13.5160	0.0000	
Ethylene Oxide	0.666	11.5880	12.0759	ppm
Acetaldehyde	0.733	1.1330	0.0000	
		77.9700	12.0759	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:25:44
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-Exh08.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



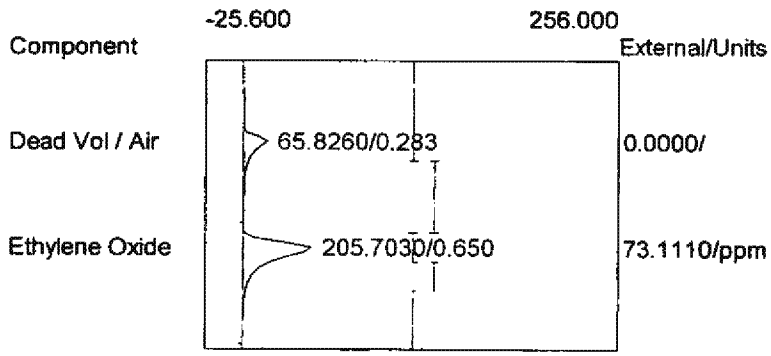
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.6960	0.0000	
Ethylene Oxide	0.650	208.0530	73.9463	ppm
		273.7490	73.9463	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:27:17
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-Exh09.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



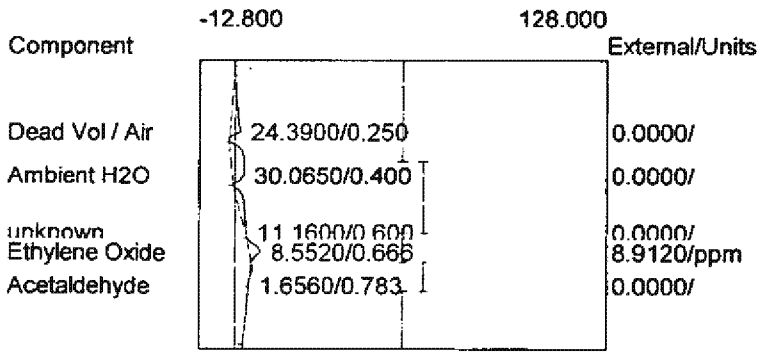
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	34.2390	0.0000	
Ambient H2O	0.483	7.2400	0.0000	
Ethylene Oxide	0.666	10.1660	10.5940	ppm
Acetaldehyde	0.733	1.1480	0.0000	
CO2	0.966	0.0280	0.0000	
		52.8210	10.5940	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:27:17
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-Exh09.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



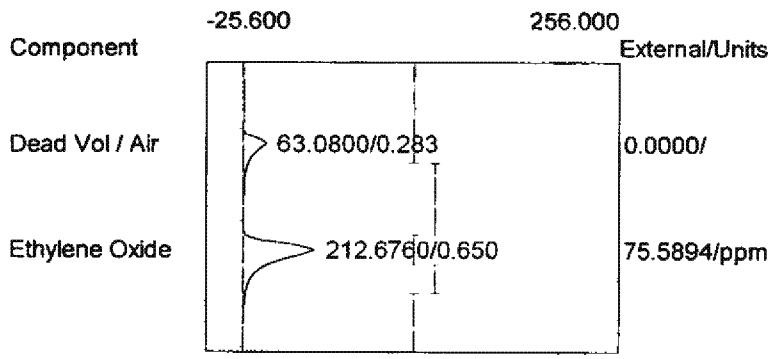
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.8260	0.0000	
Ethylene Oxide	0.650	205.7030	73.1110	ppm
		271.5290	73.1110	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:28:43
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-Exh10.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



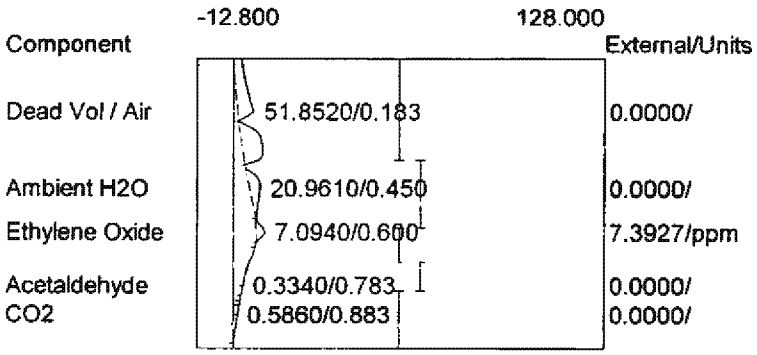
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	24.3900	0.0000	
Ambient H2O	0.400	30.0650	0.0000	
Ethylene Oxide	0.666	8.5520	8.9120	ppm
Acetaldehyde	0.783	1.6560	0.0000	
		64.6630	8.9120	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:28:43
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-Exh10.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



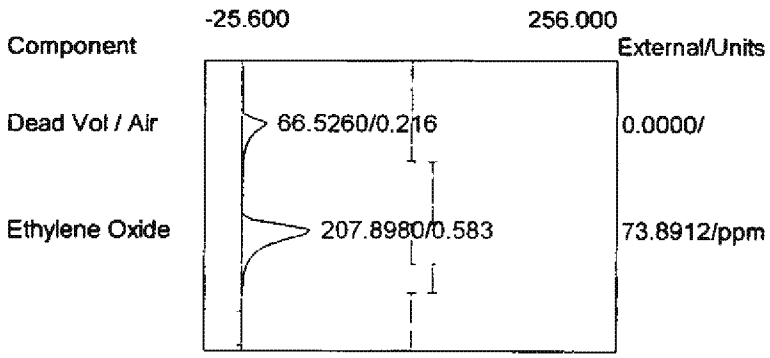
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	63.0800	0.0000	
Ethylene Oxide	0.650	212.6760	75.5894	ppm
		275.7560	75.5894	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:30:18
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-Exh11.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.183	51.8520	0.0000	
Ambient H2O	0.450	20.9610	0.0000	
Ethylene Oxide	0.600	7.0940	7.3927	ppm
Acetaldehyde	0.783	0.3340	0.0000	
CO2	0.883	0.5860	0.0000	
		80.8270	7.3927	

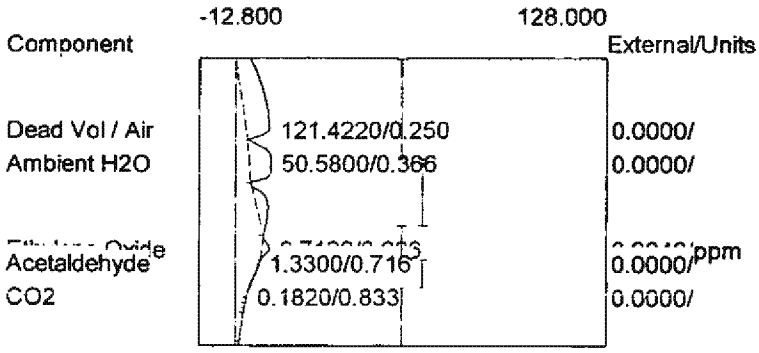
Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:30:18
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-Exh11.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer

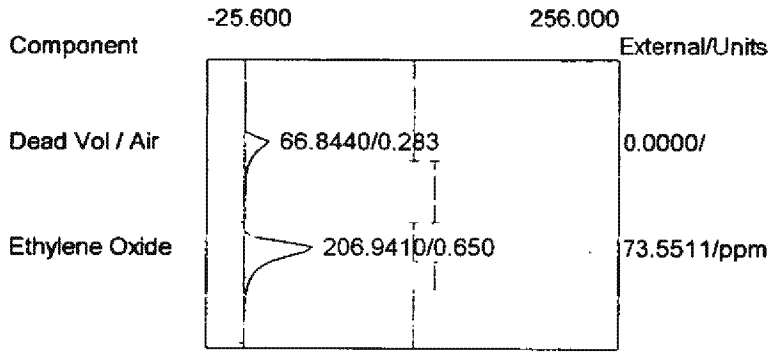


Component	Retention	Area	External	Unit
Dead Vol / Air	0.216	66.5260	0.0000	
Ethylene Oxide	0.583	207.8980	73.8912	ppm
		274.4240	73.8912	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:31:51
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-Exh12.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:31:51
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-Exh12.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer

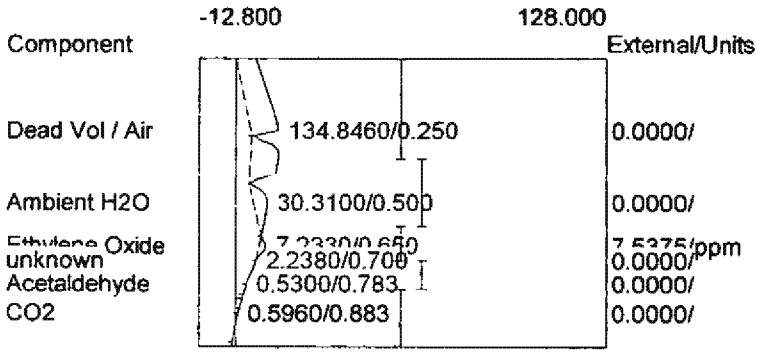




Component	Retention	Area	External	Units
Dead Vol / Air	0.250	121.4220	0.0000	
Ambient H2O	0.366	50.5800	0.0000	
Ethylene Oxide	0.666	6.7120	6.9946	ppm
Acetaldehyde	0.716	1.3300	0.0000	
CO2	0.833	0.1820	0.0000	
		180.2260	6.9946	

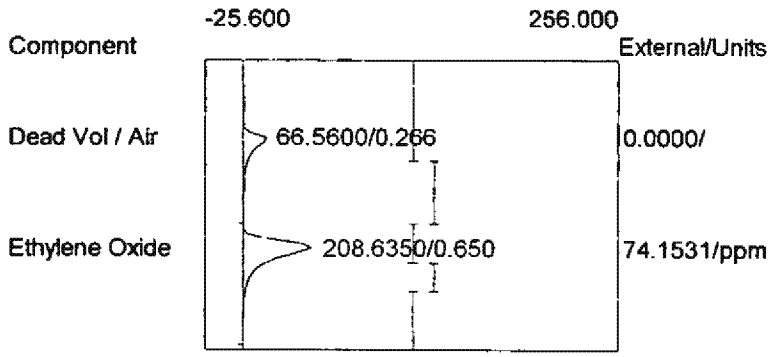
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	66.8440	0.0000	
Ethylene Oxide	0.650	206.9410	73.5511	ppm
		273.7850	73.5511	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:33:14
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-Exh13.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



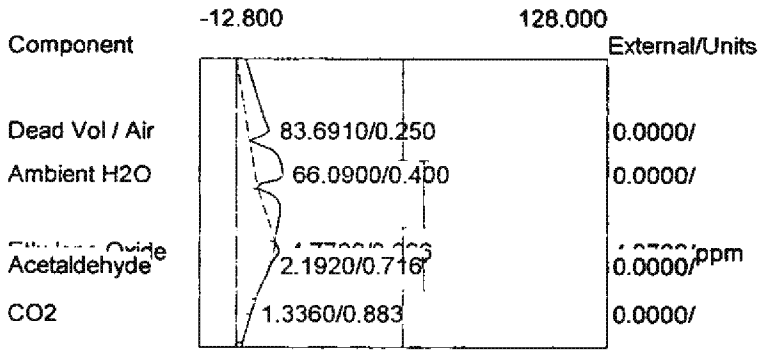
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	134.8460	0.0000	
Ambient H2O	0.500	30.3100	0.0000	
Ethylene Oxide	0.650	7.2330	7.5375	ppm
Acetaldehyde	0.783	0.5300	0.0000	
CO2	0.883	0.5960	0.0000	
		173.5150	7.5375	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:33:14
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-Exh13.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



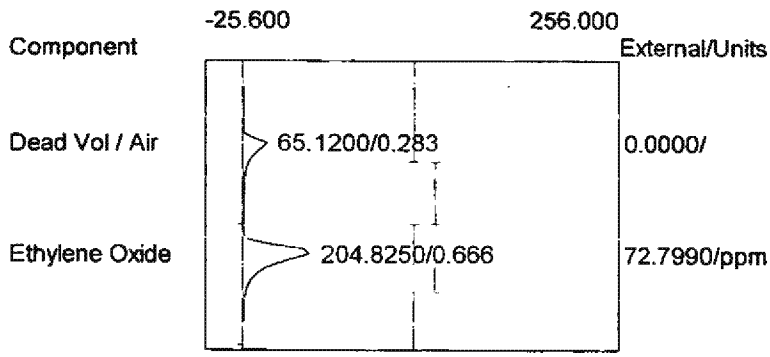
Component	Retention	Area	External	Unit
Dead Vol / Air	0.266	66.5600	0.0000	
Ethylene Oxide	0.650	208.6350	74.1531	ppm
		275.1950	74.1531	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:34:47
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-Exh14.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



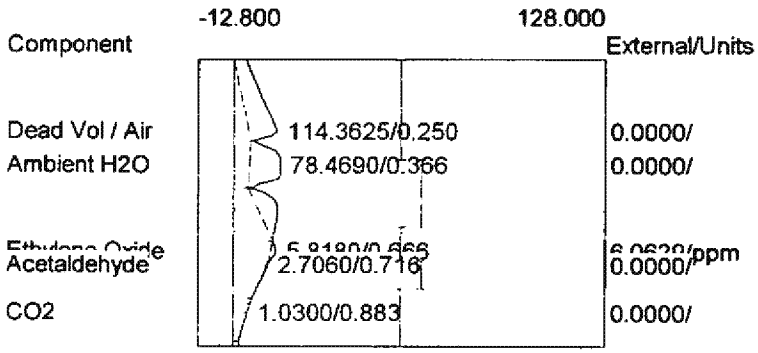
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	83.6910	0.0000	
Ambient H2O	0.400	66.0900	0.0000	
Ethylene Oxide	0.666	4.7700	4.9708	ppm
Acetaldehyde	0.716	2.1920	0.0000	
CO2	0.883	1.3360	0.0000	
		158.0790	4.9708	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:34:47
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-Exh14.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



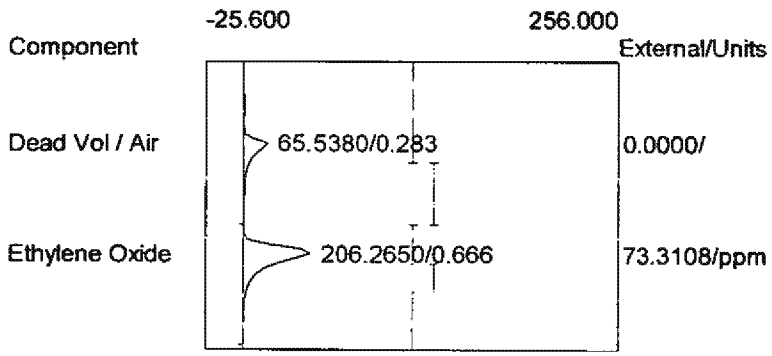
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.1200	0.0000	
Ethylene Oxide	0.666	204.8250	72.7990	ppm
		269.9450	72.7990	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:36:18
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-Exh15.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



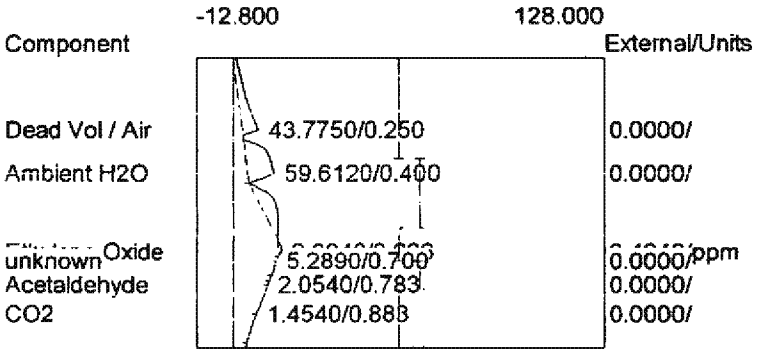
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	114.3625	0.0000	
Ambient H2O	0.366	78.4690	0.0000	
Ethylene Oxide	0.666	5.8180	6.0629	ppm
Acetaldehyde	0.716	2.7060	0.0000	
CO2	0.883	1.0300	0.0000	
		202.3855	6.0629	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:36:18
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-Exh15.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



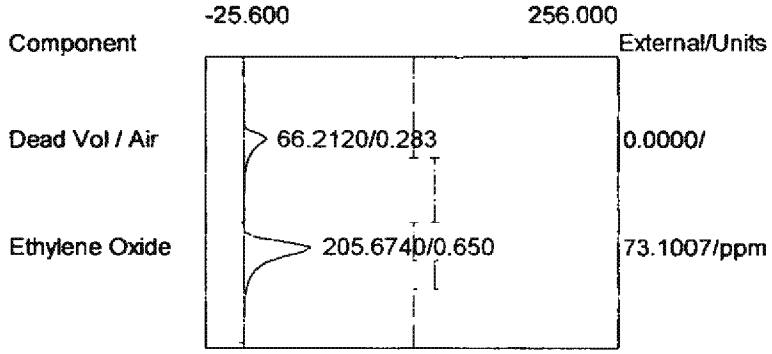
Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	65.5380	0.0000	
Ethylene Oxide	0.666	206.2650	73.3108	ppm
		271.8030	73.3108	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:37:44
Method: Direct Injection
Description: CHANNEL 1 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO1-100.CPT
Data file: 1SterigenicsWB3-Exh16.CHR (c:\peakwin)
Sample: AAT Dry Bed Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.250	43.7750	0.0000	
Ambient H2O	0.400	59.6120	0.0000	
Ethylene Oxide	0.666	2.3940	2.4948	ppm
Acetaldehyde	0.783	2.0540	0.0000	
CO2	0.883	1.4540	0.0000	
		109.2890	2.4948	

Lab name: Kremer Environmental Svcs
Client: Sterigenics - Willowbrook
Client ID: Run#3Exh
Analysis date: 06/21/2005 13:37:44
Method: Direct Injection
Description: CHANNEL 2 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: ETO-100.TEM
Components: ETO2-100.CPT
Data file: 2SterigenicsWB3-Exh16.CHR (c:\peakwin)
Sample: AAT Scrubber Inlet
Operator: D. Kremer



Component	Retention	Area	External	Unit
Dead Vol / Air	0.283	66.2120	0.0000	
Ethylene Oxide	0.650	205.6740	73.1007	ppm
		271.8860	73.1007	

APPENDIX H

Field Data and Calculation Worksheets

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

Run #1 - Backvent Phase - Chamber #8
AAT Safe Cell System - Dry Bed Outlet
Sterigenics EO, Inc. - Willowbrook, IL
June 21, 2005

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.19	0.4359	107	0.20
0.18	0.4243	107	0.49
0.19	0.4359	107	1.17
0.18	0.4243	107	0.40
0.19	0.4359	107	0.01
0.18	0.4243	107	0.28
0.18	0.4243	107	0.01
0.18	0.4243	107	0.41
0.17	0.4123	107	0.09
0.18	0.4243	107	0.01
0.18	0.4243	107	0.03
Average = 0.1818	0.4263	107	**0.2818**
	=	567	degR

stack ID =	36	in.
stack area =	7.069	sq. ft.
press =	29.25	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	29.75	ft/sec
Flow =	**11143**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0003590**	**lbs/min**
BV start =	834	
BV stop =	849	
min/cycle =	15	
Outlet EtO Emissions =	**0.0054**	**lbs/cycle**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

Run #2 - Backvent Phase - Chamber B
AAT Safe Cell System - Dry Bed Outlet
Sterigenics EO, Inc. - Willowbrook, IL
June 21, 2005

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.18	0.4243	108	0.21
0.19	0.4359	108	0.19
0.18	0.4243	108	0.01
0.19	0.4359	108	0.01
0.18	0.4243	108	0.01
0.18	0.4243	108	0.01
0.18	0.4243	108	0.18
0.17	0.4123	108	0.08
0.18	0.4243	108	0.01
0.18	0.4243	108	0.24
0.17	0.4123	108	0.33
Average = 0.1800	0.4242	108	**0.1164**
	=	568	degR

stack ID =	36	in.
stack area =	7.069	sq. ft.
press =	29.25	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	29.63	ft/sec
Flow =	**11078**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0001474**	**lbs/min**
BV start =	908	
BV stop =	923	
min/cycle =	15	
Outlet EtO Emissions =	**0.0022**	**lbs/cycle**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

Run #3 - Backvent Phase - Chamber C
AAT Safe Cell System - Dry Bed Outlet
Sterigenics EO, Inc. - Willowbrook, IL
June 21, 2005

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.19	0.4359	108	0.27
0.18	0.4243	108	0.17
0.17	0.4123	108	0.01
0.18	0.4243	108	0.01
0.18	0.4243	109	0.33
0.19	0.4359	108	0.19
0.17	0.4123	108	0.21
0.17	0.4123	108	0.01
0.18	0.4243	108	0.19
0.19	0.4359	109	0.47
0.18	0.4243	109	0.22
Average = 0.1800	0.4242	108	**0.1891**
	=	568	degR

stack ID =	36	in.
stack area =	7.069	sq. ft.
press =	29.25	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	29.64	ft/sec
Flow =	**11074**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0002394**	**lbs/min**
BV start =	908	
BV stop =	923	
min/cycle =	15	
Outlet EtO Emissions =	**0.0036**	**lbs/cycle**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

Run #1 - Exhaust Phase - Chamber #2
AAT Safe Cell System - Dry Bed Outlet
Sterigenics EO, Inc. - Willowbrook, IL
June 21, 2005

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.17	0.4123	110	0.13
0.17	0.4123	110	0.87
0.18	0.4243	111	9.65
0.18	0.4243	111	12.6
0.17	0.4123	111	14.0
0.17	0.4123	111	11.2
0.17	0.4123	110	12.5
0.18	0.4243	110	12.8
0.18	0.4243	111	11.7
0.18	0.4243	111	9.78
0.17	0.4123	111	7.98
0.18	0.4243	111	8.58
0.18	0.4243	110	7.53
0.17	0.4123	110	6.64
0.17	0.4123	110	5.61
0.17	0.4123	111	5.28
Average =			
0.1744	0.4175	111	**8.553**
	=	571	degR

stack ID =	36	in.
stack area =	7.069	sq. ft.
press =	29.25	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	29.23	ft/sec
Flow =	**10879**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0106375**	**lbs/min**
evac start =	1054	
evac stop =	1116	
min/cycle =	22	
Outlet EtO Emissions =	**0.23402**	**lbs/cycle**

INLET CALCULATION:

Pre-Evac:				Post-Evac:			
	V =	1350	ft3		V =	1350	ft3
	P =	15.8	in Hg Abs		P =	2.0	in Hg Abs
	T =	130	degF		T =	131	degF
	R =	10.73			R =	10.73	
	mw =	44.05			mw =	44.05	
	lbs EtO @ 100% =	72.75	lbs		lbs EtO @ 100% =	9.19	lbs

Initial EtO = Scale Wt. =	66.3	lbs
% EtO @ Chamber = Scale Wt. / lbs EtO @ 100% (Pre) =	91.1	%
Final EtO = % EtO @ Chamber X lbs EtO @ 100% (Post) =	8.38	lbs
INLET ETO = Initial EtO - Final EtO =	**57.9**	**lbs**
Inlet EtO (from Aeration) =	2.215	lbs
TOTAL INLET ETO =	**60.137**	**lbs**
CONTROL EFFICIENCY =	**99.6108**	**%**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

Run #1 - Exhaust Phase - Chamber #2
AAT Safe Cell System - Aeration Inlet
Sterigenics EO, Inc. - Willowbrook, IL
June 21, 2005

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.17	0.4123	110	81.7
0.17	0.4123	110	83.4
0.18	0.4243	111	80.1
0.18	0.4243	111	81.5
0.17	0.4123	111	80.3
0.17	0.4123	111	81.6
0.17	0.4123	110	79.3
0.18	0.4243	110	81.8
0.18	0.4243	111	81.3
0.18	0.4243	111	80.4
0.17	0.4123	111	80.7
0.18	0.4243	111	80.3
0.18	0.4243	110	78.9
0.17	0.4123	110	80.7
0.17	0.4123	110	81.7
0.17	0.4123	111	81.5
Average = 0.1744	0.4175	111	**80.95**
	=	571	degR

stack ID =	36	in.
stack area =	7.069	sq. ft.
press =	29.25	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	29.23	ft/sec
Flow =	**10879**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.1006773**	**lbs/min**
evac start =	1054	
evac stop =	1116	
min/cycle =	22	
Outlet EtO Emissions =	**2.2149**	**lbs/cycle**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

Run #2 - Exhaust Phase - Chamber #9
AAT Safe Cell System - Dry Bed Outlet
Sterigenics EO, Inc. - Willowbrook, IL
June 21, 2005

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.17	0.4123	110	0.85
0.17	0.4123	110	2.38
0.17	0.4123	110	12.9
0.17	0.4123	110	11.0
0.17	0.4123	111	14.4
0.17	0.4123	111	15.9
0.18	0.4243	111	14.3
0.18	0.4243	110	12.1
0.18	0.4243	110	12.9
0.17	0.4123	111	9.88
0.17	0.4123	111	9.77
0.17	0.4123	111	7.16
0.17	0.4123	111	6.30
0.17	0.4123	111	5.80
Average =			
0.1721	0.4149	111	**9.689**
	=	571	degR

stack ID =	36	in.
stack area =	7.069	sq. ft.
press =	29.25	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	29.04	ft/sec
Flow =	**10809**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0119726**	**lbs/min**
evac start =	1149	
evac stop =	1209	
min/cycle =	20	
Outlet EtO Emissions =	**0.23945**	**lbs/cycle**

INLET CALCULATION:

Pre-Evac:				Post-Evac:			
	V =	1333	ft3		V =	1333	ft3
	P =	15.9	in Hg Abs		P =	2.0	in Hg Abs
	T =	130	degF		T =	130	degF
	R =	10.73			R =	10.73	
	mw =	44.05			mw =	44.05	
	lbs EtO @ 100% =	72.29	lbs		lbs EtO @ 100% =	9.09	lbs

Initial EtO = Scale Wt. =	62.5	lbs
% EtO @ Chamber = Scale Wt. / lbs EtO @ 100% (Pre) =	86.5	%
Final EtO = % EtO @ Chamber X lbs EtO @ 100% (Post) =	7.86	lbs
INLET ETO = Initial EtO - Final EtO =	**54.6**	**lbs**
Inlet EtO (from Aeration) =	1.882	lbs
TOTAL INLET ETO =	**56.520**	**lbs**
CONTROL EFFICIENCY =	**99.5763**	**%**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

Run #2 - Exhaust Phase - Chamber #9
AAT Safe Cell System - Aeration Inlet
Sterigenics EO, Inc. - Willowbrook, IL
June 21, 2005

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.17	0.4123	110	76.9
0.17	0.4123	110	76.8
0.17	0.4123	110	76.6
0.17	0.4123	110	76.2
0.17	0.4123	111	76.5
0.17	0.4123	111	74.9
0.18	0.4243	111	75.3
0.18	0.4243	110	75.9
0.18	0.4243	110	75.8
0.17	0.4123	111	77.0
0.17	0.4123	111	77.1
0.17	0.4123	111	75.9
0.17	0.4123	111	76.0
0.17	0.4123	111	74.9
Average = 0.1721	0.4149	111	**76.13**
	=	571	degR

stack ID =	36	in.
stack area =	7.069	sq. ft.
press =	29.25	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	29.04	ft/sec
Flow =	**10809**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0940751**	**lbs/min**
evac start =	1149	
evac stop =	1209	
min/cycle =	20	
Outlet EtO Emissions =	**1.8815**	**lbs/cycle**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

Run #3 - Exhaust Phase - Chamber #10
AAT Safe Cell System - Dry Bed Outlet
Sterigenics EO, Inc. - Willowbrook, IL
June 21, 2005

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.17	0.4123	111	6.23
0.18	0.4243	111	12.6
0.17	0.4123	111	15.0
0.17	0.4123	111	13.8
0.17	0.4123	111	16.6
0.17	0.4123	111	16.5
0.17	0.4123	111	13.5
0.17	0.4123	111	12.1
0.17	0.4123	111	10.6
0.17	0.4123	111	8.91
0.17	0.4123	111	7.39
0.17	0.4123	111	6.99
0.17	0.4123	111	7.54
0.17	0.4123	111	4.97
0.17	0.4123	110	6.06
0.17	0.4123	110	2.49
Average = 0.1706	0.4131	111	**10.08**
	=	571	degR

stack ID =	36	in.
stack area =	7.069	sq. ft.
press =	29.25	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	28.92	ft/sec
Flow =	**10759**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0123985**	**lbs/min**
evac start =	1315	
evac stop =	1337	
min/cycle =	22	
Outlet EtO Emissions =	**0.27277**	**lbs/cycle**

INLET CALCULATION:

Pre-Evac:				Post-Evac:			
	V =	1345	ft3		V =	1345	ft3
	P =	15.9	in Hg Abs		P =	2.0	in Hg Abs
	T =	131	degF		T =	130	degF
	R =	10.73			R =	10.73	
	mw =	44.05			mw =	44.05	
	lbs EtO @ 100% =	72.82	lbs		lbs EtO @ 100% =	9.18	lbs

Initial EtO = Scale Wt. =	66.3	lbs
% EtO @ Chamber = Scale Wt. / lbs EtO @ 100% (Pre) =	91.0	%
Final EtO = % EtO @ Chamber X lbs EtO @ 100% (Post) =	8.35	lbs
INLET ETO = Initial EtO - Final EtO =	**57.9**	**lbs**
Inlet EtO (from Aeration) =	2.011	lbs
TOTAL INLET ETO =	**59.957**	**lbs**
CONTROL EFFICIENCY =	**99.5451**	**%**

KREMER ENVIRONMENTAL SERVICES

Ethylene Oxide Mass Emissions Data and Calculations

Run #3 - Exhaust Phase - Chamber #10
AAT Safe Cell System - Aeration Inlet
Sterigenics EO, Inc. - Willowbrook, IL
June 21, 2005

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.17	0.4123	111	74.1
0.18	0.4243	111	74.3
0.17	0.4123	111	76.1
0.17	0.4123	111	75.8
0.17	0.4123	111	74.5
0.17	0.4123	111	76.1
0.17	0.4123	111	74.9
0.17	0.4123	111	73.9
0.17	0.4123	111	73.1
0.17	0.4123	111	75.6
0.17	0.4123	111	73.9
0.17	0.4123	111	73.6
0.17	0.4123	111	74.2
0.17	0.4123	111	72.8
0.17	0.4123	110	73.3
0.17	0.4123	110	73.1
Average = 0.1706	0.4131	111	**74.33**
	=	571	degR

stack ID =	36	in.
stack area =	7.069	sq. ft.
press =	29.25	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	28.92	ft/sec
Flow =	**10759**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0914281**	**lbs/min**
evac start =	1315	
evac stop =	1337	
min/cycle =	22	
Outlet EtO Emissions =	**2.0114**	**lbs/cycle**

ETHYLENE OXIDE SOURCE TEST/CALIBRATION DATA

Client: Sterigenics - Willowbrook

Source Tested: AAT Safe Cell System Date: 6/21/05

PRE CALIBRATION									
Outlet (PID)	Calibration Gas Conc. (ppmv)	1.020 ppm EtO	10.11 ppm EtO	103.2 ppm EtO			10 ppm HCFC22	100 ppm HCFC22	1000 ppm HCFC22
	Area Counts #1	.985	10.2	91.6					
	Area Counts #2	.974	10.4	94.0					
	Average Area	.980	10.3	92.8					
	Audit Standard (49.0 ppmv) Result					50.1			
Inlet (FID)	Calibration Gas Conc. (ppmv)	1.020 ppm EtO	10.11 ppm EtO	103.2 ppm EtO	1045 ppm EtO	10270 ppm EtO	10 ppm HCFC124	100 ppm HCFC124	1000 ppm HCFC124
	Area Counts #1	2.76	28.5	308					
	Area Counts #2	2.71	27.9	304					
	Average Area	2.74	28.2	306					
	Audit Standard (49.0 ppmv) Result					51.6			

	Ch.2 Run #1	Ch.9 Run #2	Ch.10 Run #3
Exhaust Start/Stop:	1054/1116	1149/1209	1315/1337
Backvent ~~Aeration~~ Start/Stop:	0834/0849	0906/0923	0948/1003
	Ch.8	Ch.B	Ch.C

P_{bar}: 29.25 %H_2O: 3

EtO Usage (lbs/yr): —

Cycles Per Week: —

POST CALIBRATION									
Outlet (PID)	Calibration Gas Conc. (ppmv)	1.020 ppm EtO	10.11 ppm EtO	103.2 ppm EtO			10 ppm HCFC22	100 ppm HCFC22	1000 ppm HCFC22
	Area Counts #1								
	Area Counts #2								
	Average Area								
	Audit Standard (49.0 ppmv) Result					50.7			
Inlet (FID)	Calibration Gas Conc. (ppmv)	1.020 ppm EtO	10.11 ppm EtO	103.2 ppm EtO	1045 ppm EtO	10270 ppm EtO	10 ppm HCFC124	100 ppm HCFC124	1000 ppm HCFC124
	Area Counts #1								
	Area Counts #2								
	Average Area								
	Audit Standard (49.0 ppmv) Result					49.4			

KES

KREMER ENVIRONMENTAL SERVICES - VELOCITY TRAVERSE DATA

Client: Sterigenics, Inc. Run #: 1 Date: 6/20/2005 Port Sketch:

Location: Willowbrook, Illinois Probe Type: Std. Baro Press: 29.40

Source: AAT Safe Cell Emission Control System Stack I.D.: 36 in. Static Press: -0.01

	Port 1							Port 2						
Inches From Port	Point#	Delta P Low	Delta P High	Delta P Average	Delta P Sq Root	Stack Temp (F)	Cyclonic Angle	Point#	Delta P Low	Delta P High	Delta P Average	Delta P Sq Root	Stack Temp (F)	Cyclonic Angle
1.2	1	0.16	0.16	0.16	0.4000	110	0	1	0.16	0.16	0.16	0.4000	110	0
3.75	2	0.17	0.17	0.17	0.4123	110	0	2	0.16	0.17	0.165	0.4062	111	0
6.9	3	0.18	0.18	0.18	0.4243	110	0	3	0.17	0.17	0.17	0.4123	111	0
11.7	4	0.17	0.18	0.175	0.4183	111	0	4	0.18	0.18	0.18	0.4243	111	0
24.3	5	0.18	0.19	0.185	0.4301	111	0	5	0.17	0.18	0.175	0.4183	111	0
29.1	6	0.18	0.18	0.18	0.4243	111	0	6	0.17	0.17	0.17	0.4123	112	0
32.3	7	0.17	0.17	0.17	0.4123	111	0	7	0.17	0.17	0.17	0.4123	112	0
34.8	8	0.16	0.17	0.165	0.4062	112	0	8	0.16	0.16	0.16	0.4000	113	0
	9							9						
	10							10						
	11							11						
	12							12						
	13							13						
	14							14						
	15							15						
	16							16						
	17							17						
	18							18						
	19							19						
	20							20						
	21							21						
	22							22						
	23							23						
	24							24						
								Average Values:			0.1709	0.4133	111.1	0.0

ED_002192_00004535-00135

APPENDIX I

Calibration Gas Certificates

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (909) 653-6780 • FAX (909) 653-2430

REPORT OF ANALYSIS

KRES01

TO: Dan Kremer
Kremer Environmental Svcs
28151 San Lucas
Mission Viejo CA 92692-1313

DATE: 9/26/03

CUSTOMER ORDER NUMBER: Vbl/D Kremer

CYLINDER NUMBER : FF40509

COMPONENT	CONCENTRATION(v/v)
Ethylene Oxide	1.020 ± 0.051 ppm
Nitrogen	Balance @ 2000 psig

ppm = µmole/mole % = mole-%

ANALYST M. Dodd-Davison **APPROVED** J.T. Marrin

The only liability of this company for gas which fails to comply with this analysis shall be replacement or reanalysis thereof by the company without extra cost.

STANDARD CALIBRATION GASES IN ALUMINUM CYLINDERS

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (909) 653-6780 • FAX (909) 653-2430

REPORT OF ANALYSIS

KRES01 **DATE:** 9/26/03

TO: Dan Kremer
Kremer Environmental Svcs
28151 San Lucas
Mission Viejo CA 92692-1313

CUSTOMER ORDER NUMBER: Vbl/D Kremer

CYLINDER NUMBER : FF17173

COMPONENT	**CONCENTRATION(v/v)**
Ethylene Oxide	10.11 ± 0.20 ppm
Nitrogen	Balance @ 2000 psig

ppm = µmole/mole % = mole-%

ANALYST M. Dodd-Davison **APPROVED** J.T. Marrin

The only liability of this company for gas which fails to comply with this analysis shall be replacement or reanalysis thereof by the company without extra cost.

STANDARD CALIBRATION GASES IN ALUMINUM CYLINDERS

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (909) 653-6780 • FAX (909) 653-2430

REPORT OF ANALYSIS

KRES01

DATE: 9/26/03

TO: Dan Kremer
Kremer Environmental Svcs
28151 San Lucas
Mission Viejo CA 92692-1313

CUSTOMER ORDER NUMBER: Vbl/D Kremer

CYLINDER NUMBER : FF17188

COMPONENT	CONCENTRATION(v/v)
Ethylene Oxide	103.2 ± 1.0 ppm
Nitrogen	Balance @ 2000 psig

ppm = µmole/mole % = mole-%

ANALYST M. Dodd-Davison **APPROVED** J.T. Marrin

The only liability of this company for gas which fails to comply with this analysis shall be replacement or reanalysis thereof by the company without extra cost.

STANDARD CALIBRATION GASES IN ALUMINUM CYLINDERS

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (909) 653-6780 • FAX (909) 653-2430

REPORT OF ANALYSIS

KRES01 **DATE:** 9/26/03

TO: Dan Kremer
Kremer Environmental Svcs
28151 San Lucas
Mission Viejo CA 92692-1313

CUSTOMER ORDER NUMBER: Vbl/D Kremer

CYLINDER NUMBER : FF21283

COMPONENT	CONCENTRATION(v/v)
Ethylene Oxide	1045 ± 10 ppm
Nitrogen	Balance @ 2000 psig

ppm = µmole/mole % = mole-%

ANALYST M. Dodd-Davison **APPROVED** J.T. Marrin

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STANDARD CALIBRATION GASES IN ALUMINUM CYLINDERS

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (909) 653-6780 • FAX (909) 653-2430

REPORT OF ANALYSIS

KRES01

DATE: 9/26/03

TO: Dan Kremer
Kremer Environmental Svcs
28151 San Lucas
Mission Viejo CA 92692-1313

CUSTOMER ORDER NUMBER: Vbl/D Kremer

CYLINDER NUMBER : FF35819

COMPONENT	CONCENTRATION(v/v)
Ethylene Oxide	10270 ± 103 ppm
Nitrogen	Balance @ 1000 psig

ppm = µmole/mole % = mole-%

ANALYST M. Dodd-Davison **APPROVED** J.T. Marrin

The only liability of this company for gas which fails to comply with this analysis shall be replacement or reanalysis thereof by the company without extra cost.

STANDARD CALIBRATION GASES IN ALUMINUM CYLINDERS

SPECGAS, INC.

CERTIFICATE

SPECGAS, Inc.
130 Railroad Drive
Ivyland, Pa, 18974
Tel. 215 355 2405
Fax. 215 355 9925
www.specgasinc.com

NON-FLAMMABLE GAS
2

ANALYTICAL REPORT-PRODUCT CERTIFICATION

SOLD TO: Praxair Distribution Inc.
145 Shimmersville Rd.
Bethlehem, Pa 18015

SHIP TO: Praxair Distribution Inc.
1545 E. Edinger Ave.
Santa Ana, CA 92705

DATE: 09/12/03
P.O. # 12350
ORDER # 091203A

CYLINDER #	CONSTITUENT CONCENTRATION		NOMINAL	ACTUAL
	CERTIFIED STANDARD MIXTURE			
FF10136				
	Ethylene Oxide	**(C_2H_4O)**	**50.0 ppm**	**49.0 ppm**
	Nitrogen	**(N_2)**	**Balance**	**Balance**

Blend Tolerance +/- 5%
Analytical Accuracy ≤ 2%

PRESSURE: 2000 PSIA (138 bar)
Valve: CGA-350
ANALYSIS DATE: 09/12/03
EXPIRATION DATE: 09/12/04
Compressed Gas N.O.S.
UN 1956
Emergency Phone # 215 906 9722

ANALYST

09/12/03
Date

APPENDIX J

Process Data

KES

ED_002192_00004535-00143

STERIGENICS
7775 QUINCY STREET
WILLOWBROOK, IL 60527
1-630-654-5151
CHAMBER NO. 2

DATE	06/21/05 Tue	CYCLE 996	STERILANT	EO
PROGRAM VERSION	3J-1		CHECK VALUE	3151
RUN NUMBER	1452-0221		OPERATOR	R. CLARK

CUSTOMER
LOT NO.
QUANTITY
PRODUCT

AAT SCRUBBER COMPLIANCE TEST RUN
EMPTY CHAMBER RUN

STERILANT TANK LOT # E003057/UTLX902675E5, TARE WEIGHT: 269.0 LBS

PROCESS PARAMETERS

CHAMBER TEMP 130 F

VACUUM 2.0 INHGA, FAST

HUMIDIFICATION NONE

GAS 15.8 INHGA

AFTER VACUUM 2.0 INHGA, 1.00 INHG/MIN

GAS WASH A 2 CYCLES; RLS: 28.0 INHGA, FAST, AIR
VAC: 2.0 INHGA, 1.00 INHG/MIN

RELEASE 28.0 INHGA, FAST

TIME	TEMP	PRESSURE	GI TEMP	ALARMS & MESSAGES	ACTION TAKEN
		VACUUM PHASE			
09:47	132 F	29.3 INHGA	123 F		
09:50	128 F	24.1 INHGA	123 F		
09:53	127 F	19.4 INHGA	123 F		
09:55	126 F	15.6 INHGA	123 F	LO TEMPERATURE	
09:56	OPERATOR SENSOR CHECK -- PR 52.0, RH 126, JWT 132, VLT 129, GIT 123				
	CT1 117, CT2 130, CT3 129, P01 129, P02 129, P03 129, P04 129				
	P05 129, P06 129, P07 129, P08 129, WT 673.3				
09:56	126 F	14.6 INHGA	123 F		
09:59	125 F	10.6 INHGA	123 F		
10:02	125 F	7.6 INHGA	123 F		
10:05	126 F	5.4 INHGA	123 F		
10:08	127 F	3.8 INHGA	123 F		
10:10	127 F	2.9 INHGA	123 F		OPERATOR CYCLE STOP
10:11	127 F	3.0 INHGA	123 F		
10:13	129 F	3.0 INHGA	122 F		CYCLE CONTINUED
10:14	128 F	2.5 INHGA	122 F		

06/21/05 Tue CYCLE 996 RUN NUMBER 1452-0221

TIME	TEMP	PRESSURE	GI TEMP	ALARMS & MESSAGES	ACTION TAKEN
10:16	128 F	2.0 INHGA	121 F		
MAX:	132 F	-27.3 INHG	123 F	PHASE 0:26	PHASE ELAPSED 0:28
MIN:	125 F	(CHANGE)	121 F		CYCLE 0:28

GAS (EO) PHASE

10:16	128 F	2.0 INHGA	121 F		
10:18	132 F	4.2 INHGA	103 F		
10:20	132 F	6.2 INHGA	103 F		
10:22	132 F	8.0 INHGA	108 F		
10:24	132 F	9.8 INHGA	113 F		
10:26	132 F	11.6 INHGA	118 F		
10:28	132 F	13.2 INHGA	120 F		
10:30	132 F	14.9 INHGA	123 F		
10:32	131 F	15.3 INHGA	124 F		
10:34	130 F	15.3 INHGA	123 F		
10:36	130 F	15.3 INHGA	122 F		
10:38	130 F	15.3 INHGA	122 F		
10:40	130 F	15.3 INHGA	121 F		
10:42	130 F	15.3 INHGA	121 F		
10:44	130 F	15.4 INHGA	121 F		
10:46	130 F	15.4 INHGA	121 F		
10:48	130 F	15.4 INHGA	121 F		
10:50	130 F	15.4 INHGA	121 F		
10:51	130 F	15.8 INHGA	115 F		
MAX:	132 F	13.8 INHG	124 F	PHASE 0:35	PHASE ELAPSED 0:35
MIN:	128 F	(CHANGE)	103 F		CYCLE 1:03

STERILANT USED THIS PHASE: 66.3 LBS, CYCLE TOTAL: 66.3 LBS

AFTER VACUUM PHASE

10:51	130 F	15.8 INHGA	116 F		
10:55	OPERATOR SENSOR CHECK -- PR 42.1, RH 127, JWT 144, VLT 127, GIT 118				
	CT1 124, CT2 130, CT3 129, P01 127, P02 127, P03 127, P04 127				
	P05 127, P06 127, P07 127, P08 127, WT 607.3				
10:56	128 F	10.8 INHGA	118 F		
11:01	128 F	6.7 INHGA	119 F		
11:06	130 F	4.0 INHGA	120 F		
11:11	131 F	2.5 INHGA	121 F		
11:13	131 F	2.0 INHGA	121 F		
MAX:	131 F	-13.8 INHG	121 F	PHASE 0:22	PHASE ELAPSED 0:22
MIN:	128 F	(CHANGE)	116 F		CYCLE 1:26

GAS WASH A PHASE

06/21/05 Tue CYCLE 996 RUN NUMBER 1452-0221

TIME	TEMP	PRESSURE	GI TEMP	ALARMS & MESSAGES	ACTION TAKEN
RELEASE 1					
11:13	131 F	2.0 INHGA	121 F		
11:14	131 F	2.5 INHGA	121 F		OPERATOR CYCLE STOP
11:16	133 F	2.7 INHGA	122 F		
11:19	133 F	2.7 INHGA	122 F		
11:21	133 F	2.7 INHGA	122 F		CYCLE CONTINUED
11:22	141 F	11.7 INHGA	122 F		
11:23	143 F	17.4 INHGA	123 F	HI TEMPERATURE	
11:24	OPERATOR SENSOR CHECK -- PR 66.0, RH 127, JWT 135, VLT 127, GIT 123 CT1 160, CT2 136, CT3 134, P01 127, P02 127, P03 127, P04 127 P05 127, P06 127, P07 127, P08 127, WT 607.2				
11:25	141 F	26.4 INHGA	123 F		
11:26	140 F	28.0 INHGA	123 F		
MAX:	143 F	26.0 INHG	123 F	PHASE 0:05	PHASE ELAPSED 0:12
MIN:	131 F	(CHANGE)	121 F	SUBPHASE 0:05	CYCLE 1:39
EVACUATION 1					
11:26	140 F	28.0 INHGA	123 F		
11:29	133 F	25.0 INHGA	123 F		
11:32	131 F	22.0 INHGA	123 F		
11:35	130 F	19.0 INHGA	124 F		
11:38	130 F	15.9 INHGA	124 F		OPERATOR CYCLE STOP
11:38	130 F	16.0 INHGA	124 F		
11:41	132 F	16.1 INHGA	124 F		
11:44	132 F	16.1 INHGA	124 F		
11:47	132 F	16.2 INHGA	124 F		
11:50	132 F	16.2 INHGA	124 F		
11:53	132 F	16.2 INHGA	124 F		
11:56	132 F	16.2 INHGA	124 F		
11:59	132 F	16.2 INHGA	124 F		
12:02	132 F	16.2 INHGA	124 F		
12:05	132 F	16.2 INHGA	124 F		
12:08	132 F	16.2 INHGA	125 F		
12:11	132 F	16.2 INHGA	125 F		
12:14	132 F	16.2 INHGA	124 F		
12:17	131 F	16.2 INHGA	124 F		
12:20	131 F	16.2 INHGA	125 F		
12:23	131 F	16.2 INHGA	124 F		
12:26	131 F	16.2 INHGA	124 F		
12:29	131 F	16.2 INHGA	124 F		
12:32	131 F	16.2 INHGA	125 F		
12:35	131 F	16.2 INHGA	124 F		
12:38	131 F	16.2 INHGA	124 F		
12:41	131 F	16.2 INHGA	124 F		
12:44	131 F	16.2 INHGA	124 F		
12:47	131 F	16.2 INHGA	124 F		
12:50	130 F	16.2 INHGA	124 F		
12:53	130 F	16.2 INHGA	124 F		
12:56	130 F	16.2 INHGA	124 F		

06/21/05 Tue CYCLE 996 RUN NUMBER 1452-0221

TIME	TEMP	PRESSURE	GI TEMP	ALARMS & MESSAGES	ACTION TAKEN
12:59	130 F	16.2 INHGA	124 F		
13:02	130 F	16.2 INHGA	124 F		
13:05	130 F	16.2 INHGA	124 F		
13:08	130 F	16.2 INHGA	124 F		
13:11	130 F	16.2 INHGA	124 F		
13:14	130 F	16.2 INHGA	124 F		
13:17	130 F	16.2 INHGA	124 F		
13:20	130 F	16.2 INHGA	124 F		
13:23	130 F	16.2 INHGA	124 F		
13:26	130 F	16.2 INHGA	123 F		
13:29	130 F	16.2 INHGA	123 F		
13:32	130 F	16.2 INHGA	123 F		
13:35	130 F	16.2 INHGA	123 F		
13:38	130 F	16.2 INHGA	123 F		
13:41	130 F	16.2 INHGA	123 F		
13:43	130 F	16.2 INHGA	123 F		CYCLE CONTINUED
13:43	129 F	15.2 INHGA	123 F	NORMAL TEMPERATURE	
13:44	129 F	14.6 INHGA	123 F		
13:47	128 F	11.7 INHGA	123 F		
13:50	128 F	8.8 INHGA	123 F		
13:53	128 F	6.3 INHGA	123 F		
13:56	129 F	4.5 INHGA	123 F		
13:59	130 F	3.1 INHGA	123 F		
14:02	131 F	2.2 INHGA	123 F		
14:03	131 F	2.0 INHGA	123 F		
MAX:	140 F	-26.0 INHG	125 F	PHASE 0:37	PHASE ELAPSED 2:49
MIN:	128 F	(CHANGE)	123 F	SUBPHASE 0:32	CYCLE 4:15

RELEASE 2

14:03	131 F	2.0 INHGA	123 F		
14:05	143 F	17.9 INHGA	124 F	HI TEMPERATURE	
14:06	143 F	19.8 INHGA	124 F		
14:06	OPERATOR SENSOR CHECK -- PR 68.3, RH 126, JWT 136, VLT 129, GIT 124 CT1 157, CT2 137, CT3 135, P01 129, P02 129, P03 129, P04 129 P05 129, P06 129, P07 129, P08 129, WT 607.2				
14:08	141 F	28.0 INHGA	124 F		
MAX:	143 F	26.0 INHG	124 F	PHASE 0:42	PHASE ELAPSED 2:54
MIN:	131 F	(CHANGE)	123 F	SUBPHASE 0:05	CYCLE 4:21

EVACUATION 2

14:08	141 F	28.0 INHGA	124 F	
14:11	133 F	25.0 INHGA	124 F	
14:14	131 F	22.0 INHGA	124 F	
14:17	131 F	19.0 INHGA	125 F	
14:20	130 F	16.0 INHGA	125 F	
14:23	130 F	12.9 INHGA	125 F	
14:23	130 F	12.6 INHGA	125 F	NORMAL TEMPERATURE
14:26	129 F	9.9 INHGA	125 F	

06/21/05 Tue CYCLE 996 RUN NUMBER 1452-0221

TIME	TEMP	PRESSURE	GI TEMP	ALARMS & MESSAGES	ACTION TAKEN
14:29	129 F	7.2 INHGA	125 F		
14:32	130 F	5.2 INHGA	125 F		
14:35	130 F	3.7 INHGA	125 F		
14:38	131 F	2.6 INHGA	125 F		
14:40	131 F	2.0 INHGA	125 F		

MAX:	141 F	-26.0 INHG	125 F	PHASE	1:14	PHASE ELAPSED	3:26
MIN:	129 F	(CHANGE)	124 F	SUBPHASE	0:32	CYCLE	4:53

RELEASE PHASE

14:40	131 F	2.0 INHGA	125 F		
14:41	142 F	10.2 INHGA	125 F	HI TEMPERATURE	
14:43	144 F	17.0 INHGA	125 F		
14:45	142 F	27.4 INHGA	125 F		
14:45	142 F	28.0 INHGA	126 F		

MAX:	144 F	26.0 INHG	126 F	PHASE	0:05	PHASE ELAPSED	0:05
MIN:	131 F	(CHANGE)	125 F			CYCLE	4:58

CYCLE COMPLETE PHASE

14:45 TOTAL CYCLE 2:43 CYCLE ELAPSED 4:58

SIGNATURES: _____ DATE

_____ OPERATOR

_____ DATE

_____ SUPERVISOR

STERIGENICS
7775 QUINCY STREET
WILLOWBROOK, IL 60527
1-630-654-5151
CHAMBER NO. 9

DATE	06/21/05 Tue	CYCLE 996		STERILANT	EO
PROGRAM VERSION	3J-1			CHECK VALUE	3151
RUN NUMBER	1459-0222			OPERATOR	R. CLARK

CUSTOMER
LOT NO.
QUANTITY
PRODUCT
AAT SCRUBBER COMPLIANCE TEST RUN
EMPTY CHAMBER RUN

STERILANT TANK LOT # E000688/UTLX901673E5, TARE WEIGHT: 263.0 LBS

PROCESS PARAMETERS

CHAMBER TEMP 130 F

VACUUM 2.0 INHGA, FAST

HUMIDIFICATION NONE

GAS 15.8 INHGA

AFTER VACUUM 2.0 INHGA, 1.00 INHG/MIN

GAS WASH A 2 CYCLES; RLS: 28.0 INHGA, FAST, AIR
VAC: 2.0 INHGA, 1.00 INHG/MIN

RELEASE 28.0 INHGA, FAST

TIME	TEMP	PRESSURE	GI TEMP	ALARMS & MESSAGES	ACTION TAKEN
		VACUUM PHASE			
09:54	131 F	29.4 INHGA	120 F		
09:57	130 F	19.6 INHGA	120 F		
10:00	130 F	13.7 INHGA	120 F		
10:03	129 F	9.9 INHGA	119 F		
10:06	129 F	7.2 INHGA	119 F		
10:09	129 F	5.0 INHGA	119 F		
10:12	129 F	3.4 INHGA	119 F		
10:13	129 F	2.9 INHGA	119 F		OPERATOR CYCLE STOP
10:15	129 F	3.0 INHGA	119 F		
10:15	129 F	3.0 INHGA	119 F		CYCLE CONTINUED
10:18	129 F	2.2 INHGA	119 F		

06/21/05 Tue CYCLE 996 RUN NUMBER 1459-0222

TIME	TEMP	PRESSURE	GI TEMP	ALARMS & MESSAGES	ACTION TAKEN
10:18	129 F	2.0 INHGA	119 F		
MAX:	131 F	-27.4 INHG	120 F	PHASE 0:22	PHASE ELAPSED 0:24
MIN:	129 F	(CHANGE)	119 F		CYCLE 0:24

GAS (EO) PHASE

10:18	129 F	2.0 INHGA	119 F
10:20	130 F	4.6 INHGA	98 F
10:22	130 F	7.2 INHGA	95 F
10:24	131 F	9.7 INHGA	98 F
10:26	131 F	12.2 INHGA	106 F
10:28	131 F	14.5 INHGA	115 F
10:30	130 F	14.6 INHGA	116 F
10:32	130 F	14.6 INHGA	116 F
10:34	130 F	14.6 INHGA	115 F
10:36	130 F	14.6 INHGA	115 F
10:38	130 F	14.6 INHGA	115 F
10:40	130 F	14.6 INHGA	116 F
10:42	130 F	14.6 INHGA	116 F
10:44	130 F	14.6 INHGA	116 F
10:46	130 F	14.6 INHGA	116 F
10:48	130 F	14.6 INHGA	116 F
10:50	130 F	14.6 INHGA	117 F
10:52	130 F	14.6 INHGA	117 F
10:54	130 F	14.6 INHGA	117 F
10:56	130 F	14.6 INHGA	117 F
10:58	130 F	14.6 INHGA	117 F
11:00	130 F	14.6 INHGA	118 F
11:02	130 F	14.6 INHGA	118 F
11:04	130 F	14.7 INHGA	118 F
11:06	130 F	14.7 INHGA	118 F
11:08	130 F	14.7 INHGA	118 F
11:10	130 F	14.7 INHGA	118 F
11:12	130 F	14.7 INHGA	118 F
11:14	130 F	14.7 INHGA	118 F
11:16	130 F	14.7 INHGA	118 F
11:18	130 F	14.7 INHGA	118 F
11:20	130 F	14.7 INHGA	118 F
11:22	130 F	14.7 INHGA	119 F
11:24	130 F	14.7 INHGA	119 F
11:26	130 F	14.7 INHGA	119 F
11:28	130 F	14.7 INHGA	119 F
11:30	130 F	14.7 INHGA	119 F
11:32	130 F	14.7 INHGA	119 F
11:34	130 F	14.7 INHGA	119 F
11:36	130 F	14.7 INHGA	119 F
11:38	130 F	14.7 INHGA	119 F
11:40	130 F	14.7 INHGA	119 F
11:42	130 F	14.7 INHGA	119 F
11:44	130 F	14.7 INHGA	119 F

06/21/05 Tue CYCLE 996 RUN NUMBER 1459-0222

TIME	TEMP	PRESSURE	GI TEMP	ALARMS & MESSAGES	ACTION TAKEN
11:45	130 F	15.8 INHGA	110 F		
MAX:	131 F	13.8 INHG	119 F	PHASE 1:27	PHASE ELAPSED 1:27
MIN:	129 F	(CHANGE)	95 F		CYCLE 1:51

STERILANT USED THIS PHASE: 62.5 LBS, CYCLE TOTAL: 62.5 LBS

AFTER VACUUM PHASE

11:46	130 F	15.9 INHGA	110 F		
11:47	OPERATOR SENSOR CHECK -- PR 46.9, RH 0, JWT 131, VLT FAIL, GIT 110				
	CT1 129, CT2 131, CT3 129, P01 74, P02 FAIL, P03 FAIL, P04 102				
	P05 102, P06 102, P07 102, P08 102, WT 309.2				
11:51	130 F	10.8 INHGA	112 F		
11:56	129 F	6.6 INHGA	114 F		
12:01	129 F	3.8 INHGA	115 F		
12:06	130 F	2.2 INHGA	116 F		
12:06	130 F	2.0 INHGA	116 F		
MAX:	130 F	-13.9 INHG	116 F	PHASE 0:20	PHASE ELAPSED 0:20
MIN:	129 F	(CHANGE)	110 F		CYCLE 2:12

GAS WASH A PHASE

RELEASE 1

12:06	130 F	2.0 INHGA	116 F	
12:09	132 F	19.3 INHGA	118 F	
12:10	132 F	23.0 INHGA	118 F	OPERATOR CYCLE STOP
12:12	132 F	22.7 INHGA	119 F	
12:15	131 F	22.7 INHGA	119 F	
12:18	131 F	22.7 INHGA	120 F	
12:21	131 F	22.7 INHGA	120 F	
12:24	131 F	22.7 INHGA	120 F	
12:27	131 F	22.7 INHGA	121 F	
12:30	131 F	22.7 INHGA	121 F	
12:33	131 F	22.7 INHGA	121 F	
12:36	130 F	22.7 INHGA	121 F	
12:39	130 F	22.7 INHGA	121 F	
12:42	130 F	22.7 INHGA	121 F	
12:45	130 F	22.7 INHGA	121 F	
12:48	130 F	22.7 INHGA	121 F	
12:51	130 F	22.7 INHGA	121 F	
12:54	130 F	22.7 INHGA	121 F	
12:57	130 F	22.7 INHGA	121 F	
13:00	130 F	22.7 INHGA	121 F	
13:03	130 F	22.7 INHGA	121 F	
13:06	130 F	22.7 INHGA	121 F	
13:09	130 F	22.7 INHGA	121 F	
13:12	130 F	22.7 INHGA	121 F	
13:15	130 F	22.7 INHGA	121 F	
13:18	130 F	22.7 INHGA	121 F	

06/21/05 Tue CYCLE 996 RUN NUMBER 1459-0222

TIME	TEMP	PRESSURE	GI TEMP	ALARMS & MESSAGES		ACTION TAKEN	
13:21	130 F	22.7 INHGA	121 F				
13:24	130 F	22.7 INHGA	121 F				
13:27	130 F	22.7 INHGA	121 F				
13:30	130 F	22.7 INHGA	121 F				
13:33	130 F	22.7 INHGA	121 F				
13:36	130 F	22.7 INHGA	121 F				
13:39	130 F	22.7 INHGA	121 F				
13:42	130 F	22.7 INHGA	121 F			CYCLE CONTINUED	
13:42	130 F	25.3 INHGA	121 F				
13:43	130 F	28.0 INHGA	121 F				
MAX:	132 F	26.0 INHG	121 F	PHASE	0:05	PHASE ELAPSED	1:37
MIN:	130 F	(CHANGE)	116 F	SUBPHASE	0:05	CYCLE	3:49

EVACUATION 1

13:43	130 F	28.0 INHGA	121 F				
13:46	130 F	25.0 INHGA	121 F				
13:49	130 F	22.1 INHGA	121 F				
13:52	130 F	19.1 INHGA	121 F				
13:55	129 F	16.0 INHGA	120 F				
13:58	129 F	13.0 INHGA	120 F				
14:01	129 F	10.0 INHGA	120 F				
14:04	129 F	7.4 INHGA	120 F				
14:07	129 F	5.2 INHGA	120 F				
14:10	130 F	3.6 INHGA	120 F				
14:13	130 F	2.5 INHGA	120 F				
14:15	130 F	2.0 INHGA	120 F				
MAX:	130 F	-26.0 INHG	121 F	PHASE	0:36	PHASE ELAPSED	2:08
MIN:	129 F	(CHANGE)	120 F	SUBPHASE	0:31	CYCLE	4:21

RELEASE 2

14:15	130 F	2.0 INHGA	120 F				
14:18	132 F	19.3 INHGA	120 F				
14:20	133 F	28.0 INHGA	121 F				
MAX:	133 F	26.0 INHG	121 F	PHASE	0:42	PHASE ELAPSED	2:14
MIN:	130 F	(CHANGE)	120 F	SUBPHASE	0:05	CYCLE	4:26

EVACUATION 2

14:20	133 F	28.0 INHGA	121 F
14:23	132 F	25.0 INHGA	121 F
14:26	131 F	22.1 INHGA	121 F
14:29	131 F	19.1 INHGA	121 F
14:32	131 F	16.0 INHGA	121 F
14:35	130 F	13.0 INHGA	121 F
14:38	130 F	10.0 INHGA	121 F

06/21/05 Tue CYCLE 996 RUN NUMBER 1459-0222

TIME	TEMP	PRESSURE	GI TEMP	ALARMS & MESSAGES		ACTION TAKEN	
14:41	130 F	7.4 INHGA	121 F				
14:44	130 F	5.2 INHGA	121 F				
14:47	130 F	3.5 INHGA	120 F				
14:50	130 F	2.4 INHGA	120 F				
14:52	130 F	2.0 INHGA	120 F				
MAX:	133 F	-26.0 INHG	121 F	PHASE	1:13	PHASE ELAPSED	2:45
MIN:	130 F	(CHANGE)	120 F	SUBPHASE	0:31	CYCLE	4:58

RELEASE PHASE

14:52	130 F	2.0 INHGA	120 F				
14:54	132 F	16.7 INHGA	121 F				
14:57	132 F	27.1 INHGA	121 F				
14:57	132 F	28.0 INHGA	121 F				
MAX:	132 F	26.0 INHG	121 F	PHASE	0:05	PHASE ELAPSED	0:05
MIN:	130 F	(CHANGE)	120 F			CYCLE	5:03

CYCLE COMPLETE PHASE

14:57	TOTAL CYCLE	3:29	CYCLE ELAPSED	5:03

SIGNATURES: _____ DATE

_____ OPERATOR

_____ DATE

_____ SUPERVISOR

STERIGENICS
7775 QUINCY STREET
WILLOWBROOK
1-630-654-5151
CHAMBER NO. 10

DATE 06/21/05 Tue
PROGRAM VERSION 3J-1
RUN NUMBER 1450-1223

CYCLE 996

STERILANT EO
CHECK VALUE 3151
OPERATOR R. CLARK

CUSTOMER
LOT NO.
QUANTITY
PRODUCT

AAT SCRUBBER COMPLIANCE TEST RUN
EMPTY CHAMBER RUN

STERILANT TANK LOT # E002863/UTLX902675E5, TARE WEIGHT: 264.0 LBS

PROCESS PARAMETERS

CHAMBER TEMP 130 F

VACUUM 2.0 INHGA, FAST

HUMIDIFICATION NONE

GAS 15.8 INHGA

AFTER VACUUM 2.0 INHGA, 1.00 INHG/MIN

GAS WASH A 2 CYCLES; RLS: 28.0 INHGA, FAST, AIR
VAC: 2.0 INHGA, 1.00 INHG/MIN

RELEASE 28.0 INHGA, FAST

TIME	TEMP	PRESSURE	GI TEMP	ALARMS & MESSAGES	ACTION TAKEN
		VACUUM PHASE			
09:58	131 F	29.3 INHGA	120 F		
10:01	130 F	20.8 INHGA	120 F		
10:04	130 F	15.2 INHGA	120 F		
10:07	130 F	11.3 INHGA	119 F		
10:10	130 F	8.2 INHGA	119 F		
10:13	129 F	5.9 INHGA	120 F		
10:16	129 F	4.3 INHGA	121 F		
10:19	129 F	3.0 INHGA	121 F		
10:20	129 F	2.9 INHGA	121 F		OPERATOR CYCLE STOP
10:22	129 F	2.9 INHGA	121 F		CYCLE CONTINUED
10:22	129 F	2.9 INHGA	121 F		
10:25	129 F	2.0 INHGA	121 F		

06/21/05 Tue CYCLE 996 RUN NUMBER 1450-1223

TIME	TEMP	PRESSURE	GI TEMP	ALARMS & MESSAGES	ACTION TAKEN
10:25	129 F	2.0 INHGA	121 F		
MAX:	131 F	-27.3 INHG	121 F	PHASE 0:24	PHASE ELAPSED 0:27
MIN:	129 F	(CHANGE)	119 F		CYCLE 0:27

GAS (EO) PHASE

10:25	129 F	2.0 INHGA	121 F
10:27	130 F	5.3 INHGA	99 F
10:29	130 F	8.3 INHGA	96 F
10:31	130 F	8.4 INHGA	98 F
10:33	130 F	8.4 INHGA	100 F
10:35	130 F	8.4 INHGA	102 F
10:37	130 F	8.4 INHGA	104 F
10:39	130 F	8.4 INHGA	105 F
10:41	130 F	8.4 INHGA	107 F
10:43	130 F	8.4 INHGA	108 F
10:45	130 F	8.4 INHGA	109 F
10:47	130 F	8.4 INHGA	110 F
10:49	130 F	8.4 INHGA	111 F
10:51	130 F	8.4 INHGA	112 F
10:53	130 F	8.4 INHGA	112 F
10:55	130 F	8.4 INHGA	113 F
10:57	130 F	8.4 INHGA	114 F
10:59	130 F	8.4 INHGA	114 F
11:01	130 F	8.4 INHGA	115 F
11:03	130 F	8.4 INHGA	115 F
11:05	130 F	8.4 INHGA	116 F
11:07	130 F	8.4 INHGA	116 F
11:09	130 F	8.4 INHGA	117 F
11:11	130 F	8.4 INHGA	117 F
11:13	130 F	8.4 INHGA	118 F
11:15	130 F	8.4 INHGA	118 F
11:17	130 F	8.4 INHGA	118 F
11:19	130 F	8.4 INHGA	118 F
11:21	130 F	8.4 INHGA	118 F
11:23	130 F	8.4 INHGA	119 F
11:25	130 F	8.4 INHGA	119 F
11:27	130 F	8.4 INHGA	119 F
11:29	130 F	8.4 INHGA	119 F
11:31	130 F	8.4 INHGA	119 F
11:33	130 F	8.4 INHGA	119 F
11:35	130 F	8.4 INHGA	119 F
11:37	130 F	8.4 INHGA	120 F
11:39	130 F	8.4 INHGA	120 F
11:41	130 F	8.4 INHGA	120 F
11:43	130 F	8.4 INHGA	120 F
11:45	130 F	8.4 INHGA	120 F
11:47	130 F	8.4 INHGA	120 F
11:49	130 F	8.4 INHGA	120 F
11:51	130 F	8.4 INHGA	120 F
11:53	130 F	8.4 INHGA	120 F
11:55	130 F	8.4 INHGA	120 F
11:57	130 F	8.4 INHGA	120 F

06/21/05 Tue CYCLE 996 RUN NUMBER 1450-1223

TIME	TEMP	PRESSURE	GI TEMP	ALARMS & MESSAGES	ACTION TAKEN
11:59	130 F	8.4 INHGA	120 F		
12:01	130 F	8.4 INHGA	120 F		
12:03	130 F	8.4 INHGA	120 F		
12:05	130 F	8.4 INHGA	120 F		
12:07	130 F	8.4 INHGA	120 F		
12:09	130 F	8.4 INHGA	120 F		
12:11	130 F	8.4 INHGA	120 F		
12:13	130 F	8.4 INHGA	120 F		
12:15	130 F	8.4 INHGA	120 F		
12:17	130 F	8.4 INHGA	120 F		
12:19	130 F	8.4 INHGA	120 F		
12:21	130 F	8.4 INHGA	120 F		
12:23	130 F	8.5 INHGA	120 F		
12:25	130 F	8.5 INHGA	120 F		
12:27	130 F	8.5 INHGA	120 F		
12:29	130 F	8.5 INHGA	120 F		
12:31	130 F	8.5 INHGA	121 F		
12:33	130 F	8.5 INHGA	121 F		
12:35	130 F	8.5 INHGA	121 F		
12:37	130 F	8.5 INHGA	120 F		
12:39	130 F	8.5 INHGA	120 F		
12:41	130 F	8.5 INHGA	120 F		
12:43	130 F	8.5 INHGA	120 F		
12:45	130 F	8.5 INHGA	121 F		
12:47	130 F	8.5 INHGA	121 F		
12:49	130 F	8.5 INHGA	121 F		
12:51	130 F	8.5 INHGA	121 F		
12:53	130 F	8.5 INHGA	121 F		
12:55	130 F	8.5 INHGA	121 F		
12:57	130 F	8.5 INHGA	121 F		
12:59	130 F	8.5 INHGA	121 F		
13:01	130 F	8.5 INHGA	121 F		
13:03	130 F	8.5 INHGA	121 F		
13:05	130 F	8.5 INHGA	121 F		
13:07	130 F	11.4 INHGA	76 F		
13:09	130 F	14.4 INHGA	84 F		
13:10	131 F	15.8 INHGA	87 F		

MAX: 131 F 13.8 INHG 121 F PHASE 2:45 PHASE ELAPSED 2:45
MIN: 129 F (CHANGE) 76 F CYCLE 3:12

STERILANT USED THIS PHASE: 66.3 LBS, CYCLE TOTAL: 66.3 LBS

AFTER VACUUM PHASE

13:11	131 F	15.9 INHGA	88 F
13:16	130 F	10.9 INHGA	80 F
13:21	129 F	6.7 INHGA	87 F
13:26	130 F	4.1 INHGA	94 F
13:31	130 F	2.5 INHGA	100 F

06/21/05 Tue CYCLE 996 RUN NUMBER 1450-1223

TIME	TEMP	PRESSURE	GI TEMP	ALARMS & MESSAGES	ACTION TAKEN
13:33	130 F	2.0 INHGA	103 F		
MAX:	131 F	-13.9 INHG	103 F	PHASE 0:22	PHASE ELAPSED 0:22
MIN:	129 F	(CHANGE)	80 F		CYCLE 3:34

GAS WASH A PHASE

RELEASE 1

13:33	130 F	2.0 INHGA	103 F		
13:33	OPERATOR SENSOR CHECK -- PR 8.8, RH 171, JWT 131, VLT FAIL, GIT 103 CT1 130, CT2 131, CT3 128, P01 FAIL, P02 FAIL, P03 FAIL, P04 FAIL P05 FAIL, P06 FAIL, P07 FAIL, P08 FAIL, WT 565.6				
13:33	130 F	3.9 INHGA	103 F		OPERATOR CYCLE STOP
13:36	130 F	4.0 INHGA	106 F		
13:39	130 F	4.0 INHGA	108 F		
13:41	130 F	4.0 INHGA	109 F		CYCLE CONTINUED
13:42	131 F	10.7 INHGA	109 F		
13:45	132 F	25.2 INHGA	112 F		
13:46	132 F	28.0 INHGA	112 F		
MAX:	132 F	26.0 INHG	112 F	PHASE 0:05	PHASE ELAPSED 0:13
MIN:	130 F	(CHANGE)	103 F	SUBPHASE 0:05	CYCLE 3:47

EVACUATION 1

13:46	132 F	28.0 INHGA	112 F		
13:49	132 F	25.0 INHGA	113 F		
13:52	131 F	22.1 INHGA	114 F		
13:55	130 F	19.0 INHGA	115 F		
13:58	130 F	16.0 INHGA	116 F		
14:01	130 F	12.9 INHGA	116 F		
14:04	130 F	10.0 INHGA	117 F		
14:07	130 F	7.3 INHGA	117 F		
14:10	130 F	5.3 INHGA	117 F		
14:13	130 F	3.8 INHGA	118 F		
14:16	130 F	2.7 INHGA	118 F		
14:19	130 F	2.0 INHGA	118 F		
MAX:	132 F	-26.0 INHG	118 F	PHASE 0:38	PHASE ELAPSED 0:45
MIN:	130 F	(CHANGE)	112 F	SUBPHASE 0:32	CYCLE 4:20

RELEASE 2

14:19	130 F	2.0 INHGA	118 F
14:22	132 F	18.8 INHGA	119 F

06/21/05 Tue CYCLE 996 RUN NUMBER 1450-1223

TIME	TEMP	PRESSURE	GI TEMP	ALARMS & MESSAGES		ACTION TAKEN	
14:24	132 F	28.0 INHGA	119 F				
MAX:	132 F	26.0 INHG	119 F	PHASE	0:44	PHASE ELAPSED	0:51
MIN:	130 F	(CHANGE)	118 F	SUBPHASE	0:05	CYCLE	4:26

EVACUATION 2

14:24	132 F	28.0 INHGA	119 F				
14:27	131 F	25.0 INHGA	119 F				
14:30	130 F	22.0 INHGA	119 F				
14:33	130 F	19.1 INHGA	119 F				
14:36	130 F	16.0 INHGA	119 F				
14:39	130 F	12.9 INHGA	119 F				
14:42	130 F	10.0 INHGA	119 F				
14:45	130 F	7.4 INHGA	119 F				
14:48	130 F	5.3 INHGA	119 F				
14:51	130 F	3.8 INHGA	119 F				
14:54	130 F	2.7 INHGA	120 F				
14:57	130 F	2.0 INHGA	120 F				
MAX:	132 F	-26.0 INHG	120 F	PHASE	1:16	PHASE ELAPSED	1:24
MIN:	130 F	(CHANGE)	119 F	SUBPHASE	0:32	CYCLE	4:59

RELEASE PHASE

14:57	130 F	2.0 INHGA	120 F				
15:00	132 F	16.3 INHGA	120 F				
15:02	132 F	26.6 INHGA	120 F				
15:03	132 F	28.0 INHGA	120 F				
MAX:	132 F	26.0 INHG	120 F	PHASE	0:05	PHASE ELAPSED	0:05
MIN:	130 F	(CHANGE)	120 F			CYCLE	5:04

CYCLE COMPLETE PHASE

15:03 TOTAL CYCLE 4:54 CYCLE ELAPSED 5:04

SIGNATURES: _____ DATE

_____ OPERATOR

_____ DATE

_____ SUPERVISOR

APPENDIX K

Parametric Monitoring Conditions

Sterigenics.

WEEKLY SCRUBBER INSPECTION FORM

Facility Name: WILLOWBROOK

Scrubber Name: AAT SCRUBBER 008

Date of Testing: 6-21-05

Note: All Sterigenics facilities are required to check the following on a weekly basis in order to be in compliance with their operating permit. This form is to be sent to Corporate EH&S weekly for their review.

1. **Scrubber Liquor Level (in inches):** 160;
2. **Maximum Level Developed in the performance test:** 160;
3. **pH of the Scrubber liquor:** ≃ 1;
4. **pH determined in the performance test:** ≃ 1;
5. **Percentage of Ethylene Glycol in the Scrubber Liquor:** ≃ 40;
6. **Scrubber Flow rate:** ≃ 1500 **gal/min:** _____ **cfm:**
7. **List any other critical scrubber parameters:** _____
8. _____

Roger Clark — **Signed by**

6-21-05 — **Date Signed**

Sterigenics International, Inc.
2015 Spring Road, Suite 650 • Oakbrook, IL 60523
Tel 800.472.4508 • Fax 630.928.1701 • www.sterigenics.com

Sterigenics.

ETR
12-13-16
IDI

ST1
043110AAC

February 13, 2017

Illinois EPA, Bureau of Air
Compliance and Enforcement Section (MC 40)
1021 North Grand Avenue East
PO Box 19276
Springfield, Illinois 62794-9276

A
no review
send
KM
2-15-17

RECEIVED
STATE OF ILLINOIS
FEB 14 2017
ENVIRONMENTAL PROTECTION AGENCY
BUREAU OF AIR

RE: Notification of Compliance Status
Sterigenics' Willowbrook, IL Facility, I.D. No.: 043110AAC
Permit No.: 95120085

Dear Sir:

This Notification of Compliance Status is being sent pursuant to 40 CFR 63.9(h) for Sterigenics' Willowbrook, IL facility. The facility is subject to the NESHAP emission standards at 40 CFR 63.362. On December 12-13, 2016 annual performance testing of the facility's Deoxx Scrubber at Willowbrook I (WB1) facility and the AAT Scrubber/Drybed at Willowbrook II (WB2) was conducted per the work practices requirement stated at 40 CFR 63.363(b)(2)(ii).

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

FEB 28 2017

REVIEWER: RDH

Facility Name:
Sterigenics U.S., LLC - Willowbrook Facility
7775 Quincy Street
Willowbrook, IL 60527

Method(s) Used to Determine Compliance - *Section 63.9(h)(A)*
Performance testing of the Willowbrook I facility's Deoxx Scrubber system was conducted on December 12, 2016 in accordance with the test methods in 40 CFR 63.365 for Ethylene Oxide Sterilization Facilities. The WB I facility's AAT scrubber/drybed system previously was tested on January 23, 2003 following test methods stated in 40 CFR 63.365.

Performance testing of the Willowbrook II facility's AAT Scrubber/Drybed system was conducted on December 13, 2016 in accordance with the test methods in 40 CFR 63.365 for Ethylene Oxide Sterilization Facilities.

Performance Test Results - *Section 63.9(h)(B)*
The December 12th testing of the WB1 Deoxx Scrubber system demonstrated an average control efficiency of 99.9996 % for treating process emissions from the facility's sterilization chamber vacuum pumps. The testing demonstrates the facility conforms to the 99.0% minimum efficiency standard specified in 40 CFR 63.362(d) and the performance standard stated in the facility's air permit. The tested operating efficiency of the WB1 AAT Scrubber/Drybed system on January 23, 2003 was 99.9 %. This performance level conforms to the 99% minimum efficiency standard in 40 CFR 63.362(c) and the 99% or < 1 ppmv control requirement in the facility's air permit.

The December 13th testing of the WB2 AAT Scrubber/Drybed system demonstrated an average control efficiency of 99.94 % for treating process emissions from the facility's sterilization chamber vacuum pumps. The tested operating efficiency of the WB2 aeration emissions through the AAT Scrubber/Drybed system demonstrated an average control efficiency of 99.96% The testing demonstrates the facility conforms to the 99.0% minimum efficiency standard specified in 40 CFR 63.362(d) and the performance standard stated in the facility's air permit.

Sterigenics International, US, LLC.
2015 Spring Road, Suite 650 • Oakbrook, IL 60523
Tel 800.472.4508 • Fax 630.928.1701 • www.sterigenics.com

ED_002192_00004536-00001

Sterigenics.

Methods to be Used for Determining Continued Compliance *Section 63.9(h)(C)*
The facility assures continuing compliance with the Section 63.362 standards by measuring and recording the Deoxx and AAT scrubber systems liquor pH and tank level on a weekly basis. The AAT Drybed systems are also tested weekly to ensure outlet emissions are below 1ppmv.

Type and Quantity of Hazardous Air Pollutants Emitted During Reporting Period - *Section 63.9(h)(D)*
The Willowbrook I facility used approximately 264,951 pounds of ethylene oxide during the 12 month period ending December 31, 2016. Approximately 95% of that amount (251, 703 pounds) is emitted through sterilization chamber vents (via vacuum pumps) to the Deoxx wet scrubber system. Using the 99.9996% control efficiency obtained from the December 12th test, the resulting emissions are calculated to be approximately 1 pound per year. Approximately 4% of the ethylene oxide used by the facility (10,598 pounds) represents process emissions from the facility's aeration room which is treated by the AAT Scrubber/Drybed system. Using the 99.9% control efficiency demonstrated during the January 23, 2003 test, the resulting annual emissions from the aeration room total approximately 11 pounds. Backvent process emissions, representing approximately 1% of total ethylene oxide used (2,650 pounds) are not treated and exhaust to atmosphere resulting in 2,650 pounds. In total, the facility had an estimated 2,662 pounds (1.33 tons) of ethylene oxide point source emissions during the 12 month period ending December 31, 2016.

The Willowbrook II facility used approximately 127,543 pounds of ethylene oxide during the 12 month period ending December 31, 2016. Approximately 95% of that amount (121,166 pounds) is emitted through sterilization chamber vents (via vacuum pumps) to the AAT Scrubber/Drybed system. Using the 99.94% control efficiency obtained from the December 13th test, the resulting emissions are calculated to be approximately 73 pounds per year. Approximately 4% of the ethylene oxide used by the facility (5,102 pounds) represents process emissions from the facility's aeration room which is also treated by the AAT Scrubber/Drybed system. Using the 99.96% control efficiency demonstrated during the December 13th test, the resulting annual emissions from the aeration room total approximately 2 pounds. Backvent process emissions, representing approximately 1% of total ethylene oxide used (1,275 pounds) are not treated and exhaust to atmosphere resulting in 1,275 pounds. In total, the facility had an estimated 1,350 pounds (0.68 tons) of ethylene oxide point source emissions during the 12 month period ending December 31, 2016.

Analysis Demonstrating Whether Source is a Major Source - *Section 63.9(h)(E)*
Based on the above emissions, the facility emits less than 10 tons/year of ethylene oxide and is an area source.

Description of Air Pollution Control Device & Control Efficiency for Facility's Emission Points – *Section 63.9(h)(F)*
For Willowbrook I, a Deoxx Acid Wet Scrubber system demonstrated to have a control efficiency of 99.9996% treats emissions from the facility's sterilization chamber vents (i.e., vacuum pump emissions). Process emissions from the facility's aeration rooms are controlled using an AAT Acid Wet Scrubber/Drybed system. The control efficiency of this device during annual testing on January 23, 2003 was 99.9%.

For Willowbrook II, an AAT Acid Wet Scrubber system demonstrated to have a control efficiency of 99.94% treats emissions from the facility's sterilization chamber vents (i.e., vacuum pump emissions). Process emissions from the facility's aeration rooms are also controlled using the AAT Acid Wet Scrubber/Drybed system. The control efficiency of this device during annual testing was 99.96%.

Statement by Owner as to Whether the Facility Has Complied with the Relevant Standard – *Section 63.9(h)(G)*
To the best of our knowledge, our Willowbrook, IL facility has operated in compliance with the applicable standards in 40 CFR Part 63, Subpart O.

Sterigenics.

Certification Statement:
To the best of the undersigned's knowledge, information and belief formed after reasonable inquiry, the information submitted in this notification of compliance status for Sterigenics' Willowbrook, IL facility is true, accurate, and complete.

KAHoffman	13-Feb-2017	Kathleen Hoffman
Signature	*Date*	*Printed Name*

If you should need further information, please contact me at (630) 928-1771 or kwagner@sterigenics.com

Sincerely,

Kevin Wagner
Director, EH&S

cc: USEPA Region 5, Air Branch
USEPA (AR-17J)
Air & Radiation Division
77 West Jackson Blvd.
Chicago, Illinois 60604

Kathy Hoffman, Sterigenics– Sr. Vice-President EH&S and Technical Services
Juan Segovia, Sterigenics–Vice-President Operations
Shawn Pollino, Sterigenics–Willowbrook General Manager

REPORT OF
AIR POLLUTION SOURCE TESTING
OF AN ETHYLENE OXIDE EMISSION-CONTROL SYSTEM
OPERATED BY STERIGENICS, INC.
IN WILLOWBROOK, ILLINOIS
ON DECEMBER 12, 2016

Submitted to:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 North Grand Avenue East
Springfield, Illinois 62794

Submitted by:

STERIGENICS US, LLC.
2015 Spring Road
Oak Brook, Illinois 60523

I.D. Number 043110AAC

Prepared by:

ECSI, INC.
PO Box 848
San Clemente, California 92674-0848

January 20, 2017

ECSi

CONTACT SUMMARY

CLIENT

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Director of Environmental Health and Safety
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FACILITY

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Vice President of Operations
STERIGENICS US, LLC.
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Willowbrook, Illinois 60521

Phone: (630)654-5151
FAX: (630)325-0020
email: jsegovia@sterigenics.com

TEST DATE

Monday, December 12, 2016

REGULATORY AGENCY

Brandon M. Nolen
Environmental Protection Engineer II
Bureau of Air – Air Permits Section
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Springfield, Illinois 62794-9276

Phone: (217)782-7390
FAX: (217)524-5023
Email: brandon.nolen@illinois.gov

TESTING CONTRACTOR

Daniel P. Kremer
Project Manager
ECSi, Inc.
PO Box 848
San Clemente, California 92674-0848

Phone: (949)400-9145
FAX: (949)281-2169
email: dankremer@ecsi1.com

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ECSi

1.0 INTRODUCTION

On Monday, December 12, 2016, ECSi, Inc. performed air pollution source testing of an ethylene oxide (EtO) emission-control device operated by Sterigenics, Inc. at their Willowbrook I facility, located at 7775 S. Quincy Street. The device tested was the Chemrox DEOXX packed tower scrubber emission-control system, which is used to control emissions from fourteen sterilizer vacuum pumps. The purpose of the testing program was to demonstrate continued compliance with the conditions established in the Air Quality Permit granted to Sterigenics by the Illinois Environmental Protection Agency (IEPA).

2.0 EQUIPMENT

The EtO gas-sterilization system is comprised of fourteen commercial sterilizers, which are discharged through liquid-ring vacuum pumps to a Chemrox DEOXX packed tower scrubber emission-control system. The gas-sterilization and emission-control equipment tested consists of the following:

- Fourteen Gas Sterilizers, each comprised of a steam-heated sterilization chamber, a recirculating vacuum pump chamber evacuation system, a backvent valve, and a fugitive emissions exhaust hood;

Sterilizer vacuum pump emissions are be controlled by:

- One Chemrox DEOXX packed tower chemical scrubber, equipped with a packed reaction/interface column, a scrubber fluid recirculation system, and a scrubber fluid reaction/storage tank.

3.0 TESTING

EtO source testing was conducted in accordance with the procedures outlined in USEPA CFR40, Part 63.365. EtO emissions monitoring was conducted simultaneously at the inlet and outlet of the packed tower scrubber during the first chamber evacuation of the sterilizer exhaust phase of one of the fourteen sterilizers. A total of three exhaust-phase test runs were performed.

During the first chamber evacuation of the exhaust phase, EtO emissions to the inlet of the packed tower scrubber were determined using the Ideal Gas Law and the chamber conditions at the beginning and at the end of the first chamber evacuation. During the first chamber evacuation of the exhaust phase, EtO emissions from the outlet of the packed tower scrubber were determined using direct source sample injection into the GC.

All exhaust phase testing was conducted during normal process load conditions, but with an empty sterilization chamber to facilitate inlet mass calculation and the performance of multiple test runs. The testing program was conducted in accordance with the procedures outlined in the following sections.

4.0 RULE/COMPLIANCE REQUIREMENTS

The EtO gas-sterilization system at Sterigenics was tested to demonstrate compliance with EPA requirements, as specified in the IEPA Air Quality Permit. The following requirements must be met:

- The sterilizer exhaust phase (post exposure vacuum pulses) emissions must be vented to control equipment with an EtO emission-reduction efficiency of at least 99 % by weight.

Testing is required to demonstrate compliance with these requirements. Source testing of the packed tower scrubber emission-control device is required initially, and may be required periodically thereafter.

5.0 TEST METHOD REFERENCE

5.1 INTRODUCTION

EtO source testing was conducted in accordance with the procedures outlined in USEPA CFR40, Part 63.365. EtO emissions monitoring was conducted simultaneously at the inlet and outlet of the packed tower scrubber during the first chamber evacuation of the sterilizer exhaust phase of one of the fourteen sterilizers. A total of three exhaust-phase test runs were performed.

Exhaust phase testing with one sterilizer discharging to the scrubber at a time represents worst-case conditions for demonstration of control efficiency compliance. At this lower inlet loading, the scrubber must perform at its maximum efficiency to achieve outlet EtO concentrations low enough to demonstrate compliance. One of the larger sterilizers was tested for each of the test runs to provide a realistic operational scenario.

During the first chamber evacuation of the exhaust phase, EtO emissions to the inlet of the packed tower scrubber were determined using the Ideal Gas Law and the chamber conditions at the beginning and at the end of the first chamber evacuation. During the first chamber evacuation of the exhaust phase, EtO emissions from the outlet of the packed tower scrubber were determined using direct source sample injection into the GC.

All exhaust phase testing was conducted during normal process load conditions, but with an empty sterilization chamber to facilitate inlet mass calculation and the performance of multiple test runs. The testing program was conducted in accordance with the procedures outlined in the following sections.

Operation and documentation of process conditions was performed by personnel from Sterigenics, Inc. using existing monitoring instruments installed by the manufacturer on the equipment to be tested. In accordance with the procedures established in USEPA CFR40, Part 63, Subpart O, scrubber liquor level was recorded.

5.2 VOLUMETRIC FLOW MEASUREMENT

Exhaust gas flow at the outlet of the scrubber was determined by 40 CFR 60, Appendix A, Method 2, using an s-type pitot tube and an inclined-oil manometer. Sampling ports were located in accordance with 40

CFR 60, Appendix A, Method 1. The test ports were located far enough from any flow disturbances to permit accurate flow measurement.

Temperature measurements were obtained from a type K thermocouple and thermometer attached to the sampling probe. Exhaust gas composition was assumed to be air and small amounts of water vapor. Water vapor was negligible and, based on previous test data, a value of 2 percent was used for flow calculations.

5.3 CONTROL EFFICIENCY AND MASS EMISSIONS MEASUREMENT

During the first chamber evacuation of the sterilizer exhaust phase, the mass emissions of EtO vented to the inlet of the scrubber were determined using the procedures outlined in CFR40, Part 63.365. This method allows the determination of the mass of EtO vented to the inlet of the scrubber through calculations based on the Ideal Gas Law and using the conditions (pressure, temperature, volume) of the sterilization chamber immediately after it has been charged with sterilant gas, and upon conclusion of the first chamber evacuation of the exhaust phase.

The mass of EtO vented to the inlet of the scrubber during the first chamber evacuation of the exhaust phase was determined by calculating the mass of EtO present in the chamber after the first chamber evacuation and subtracting it from the mass of EtO present in the chamber after it had been charged with sterilant gas. The mass of EtO present in the chamber was calculated using Equation 1, shown below in Section 5.9.

During the first chamber evacuation of the sterilizer exhaust phase, EtO emissions from the outlet were determined using direct source sample injection into the GC. The mass of EtO emitted from the outlet was determined using Equation 2, shown below in Section 5.9. Mass-mass control-efficiency of EtO during the sterilizer exhaust phase was calculated by comparing the mass of EtO vented to the system inlet to the mass of EtO vented from the system outlet.

During the sterilization chamber exhaust phase, vented gas was analyzed by an SRI, Model 8610, portable gas chromatograph (GC), equipped with the following: dual, heated sample loops and injectors; dual columns; and dual detectors. A photoionization detector (PID) was used to quantify low-level EtO emissions at the packed tower scrubber outlet.

5.4 SAMPLE TRANSPORT

Source gas was pumped to the GC at approximately 500-1000 cubic centimeters per minute (cc/min) from the sampling ports through two lengths of Teflon® sample line, each with a nominal volume of approximately 75 cubic centimeters (cc) and an outer diameter of 0.25 inch. At the outlet of the scrubber the sampling ports were located in the exhaust stack.

5.5 GC INJECTION

Source-gas samples were then injected into the GC which was equipped with two heated sampling loops, each containing a volume of approximately 2cc and maintained at 100 degrees Celsius (C). Injections occurred at approximately one-minute intervals during the sterilization chamber exhaust phase. Helium was the carrier gas for the PID.

5.6 GC CONDITIONS

The packed columns for the GC were both operated at 90 degrees C. The columns were stainless steel, 6 feet long, 0.125 inch outer diameter, packed with 1 percent SP-1000 on 60/80 mesh Carbopack B.

Any unused sample gas was vented from the GC system back to the inlet of the scrubber.

5.7 CALIBRATION STANDARDS

The PID was calibrated for low-range ppmv level analyses using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

Each of these calibration standards was in a separate, certified manufacturer's cylinder. Copies of the calibration gas laboratory certificates are attached as Appendix F.

5.8 SAMPLING DURATION

Exhaust phase EtO measurements were taken for the entire duration of the first chamber evacuation, which was approximately 10-20 minutes. This encompassed a total sampling duration of approximately 10-20 minutes for each exhaust phase test run.

5.9 CONTROL-EFFICIENCY/MASS-EMISSIONS CALCULATIONS

The following equation was used to calculate mass of EtO discharged to the inlet of the emission-control system during the first chamber evacuation of the sterilizer exhaust phase:

EQUATION 1:

$W_c = W_{ci} - W_{cf}$

Where:

W_c = Weight of EtO discharged from the sterilization chamber to the emission-control system during the first chamber evacuation, pounds

W_{ci} = $(mw)(p)(P)(V)/(R)(T)$

(and W_{cf})

Where:

W_{ci} = Weight of EtO present in the sterilization chamber before the first chamber evacuation, pounds

W_{cf} = Weight of EtO present in the sterilization chamber after the first chamber evacuation, pounds

MW = Molecular weight of EtO, 44.05 lb/mol

p = Percent of EtO in chamber

= W_s/W_i

Where:

W_s = Scale-measured weight of EtO charged into sterilization chamber

W_i = Calculated weight of EtO charged into sterilization chamber (@ 100%)

P = Sterilization chamber pressure (after charging/at the end of the 1st evac), psia

V = Sterilization chamber volume, ft^3

R = Gas constant, 10.73 $psia \cdot ft^3/mol \cdot {}^oR$

T = Sterilization chamber temperature (after charging/at the end of the 1st evac), ^oR

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Note: Standard conditions are 68°F and 1 atm.

Mass emissions of EtO during the exhaust phase were calculated using the following equation:

EQUATION 2:

$$MassRate = (VolFlow)(MolWt)(ppmv\ EtO/10^6)/(MolVol)$$

Where:

MassRate	=	EtO mass flow rate, pounds per minute
VolFlow	=	Corrected volumetric flow rate, standard cubic feet per minute at 68 degrees F
MolWt	=	44.05 pounds EtO per pound mole
ppmv EtO	=	EtO concentration, parts per million by volume
10^6	=	Conversion factor, ppmv per "cubic foot per cubic foot"
MolVol	=	385.32 cubic feet per pound mole at one atmosphere and 68 degrees F

Results of the control-efficiency testing are presented in Section 8.0 and in Table 1.

6.0 TEST SCENARIO

During exhaust phase testing, each sterilizer was tested during normal process load conditions, but with an empty sterilization chamber to facilitate the performance of multiple test runs. A total of three exhaust-phase test runs were performed to verify the performance of the emission-control device. Testing was conducted with an effort to offer minimal disruption to the Sterigenics production schedule. The testing schedule was as follows:

1) Testing equipment was set up and calibrated.
2) An empty-chamber cycle was started in one of the larger sterilizers. This sterilizer was isolated for test use and designated as a test chamber.
3) Exhaust Phase Test Run #1 was conducted. Sampling was performed at outlet of the scrubber during the first chamber evacuation of the test chamber. During the performance of the test, only the sterilizer used for the test was allowed to discharge to the Chemrox scrubber.
4) An empty-chamber cycle was started in another of the larger sterilizers. This sterilizer was isolated for test use and designated as a test chamber.
5) Exhaust Phase Test Run #2 was conducted. Sampling was performed at outlet of the scrubber during the first chamber evacuation of the test chamber. During the performance of the test, only the sterilizer used for the test was allowed to discharge to the Chemrox scrubber.
6) An empty-chamber cycle was started in another of the larger sterilizers. This sterilizer was isolated for test use and designated as a test chamber.
7) Exhaust Phase Test Run #3 was conducted. Sampling was performed at outlet of the scrubber during the first chamber evacuation of the test chamber. During the performance of the test, only the sterilizer used for the test was allowed to discharge to the Chemrox scrubber.
8) Post calibration check was performed, testing equipment was packed.

7.0 QA/QC

7.1 FIELD TESTING QUALITY ASSURANCE

At the beginning of the test, the sampling system was leak checked at a vacuum of 15 inches of mercury. The sampling system was considered leak free when the flow indicated by the rotameters fell to zero.

At the beginning of the test, a system blank was analyzed to ensure that the sampling system was free of EtO. Ambient air was introduced at the end of the heated sampling line and drawn through the sampling system line to the GC for analysis. The resulting chromatogram also provided a background level for non-EtO components (i.e. ambient air, carbon dioxide, water vapor) which are present in the source gas stream due to the ambient dilution air which is drawn into the emission-control device, and due to the destruction of EtO by the emission-control device which produces carbon dioxide and water vapor. This chromatogram, designated AMB, is included with the calibration data in Appendix A.

7.2 CALIBRATION PROCEDURES

The GC system was calibrated at the beginning and conclusion of each day's testing. Using the Peaksimple II analytical software, a point-to-point calibration curve was constructed for each detector. A gas cylinder of similar composition as the calibration gases, but certified by a separate supplier, was used to verify calibration gas composition and GC performance.

All calibration gases and support gases used were of the highest purity and quality available. A copy of the laboratory certification for each calibration gas is attached as Appendix F.

8.0 TEST RESULTS

The Ceilcote scrubber demonstrated an EtO control efficiency of 99.9996 percent. In accordance with EPA requirements, as specified in the IEPA Air Quality Permit, this control equipment must have an EtO control efficiency of 99 percent or more during the sterilizer exhaust phase (vacuum pump emissions). The emission-control device met this requirement.

The test results are summarized in Table 1. These tables include results for EtO control efficiency of the emission-control device. Chromatograms and chromatographic supporting data are attached as Appendices A through D. Copies of field data and calculation worksheets are attached as Appendix E.

TABLES

TABLE 1
ETHYLENE OXIDE CONTROL EFFICIENCY
OF A CHEMROX DEOXX PACKED TOWER SCRUBBER EMISSION CONTROL DEVICE
OPERATED BY STERIGENICS, INC.
IN WILLOWBROOK, ILLINOIS (PLANT 1)
DECEMBER 12, 2016

Run #	Stack Flow (dscfm) (2)	Average Outlet Conc. (ppm) (1)	Outlet EtO Mass Flow (lbs/min) (3)	Minutes/ Cycle	Outlet EtO Mass Emissions (lbs)	Inlet EtO Mass Emissions (lbs)	EtO Control Efficiency (%)
#1	63.8	0.3021	0.0000022	19	0.0000419	47.4	99.9999
#2	65.4	1.325	0.0000099	17	0.0001683	50.8	99.9997
#3	140	0.010	0.0000002	11	0.0000019	39.3	100.0000
						Average EtO Control Efficiency:	**99.9999**
						Required EtO Control Efficiency:	**99**

Notes: (1) - PPM = parts per million by volume
(2) - DSCFM = dry standard cubic feet per minute
(3) - LBS/MIN = EtO emissions, pounds per minute
(4) - Testing was performed with the scrubber liquor level at 181 inches.

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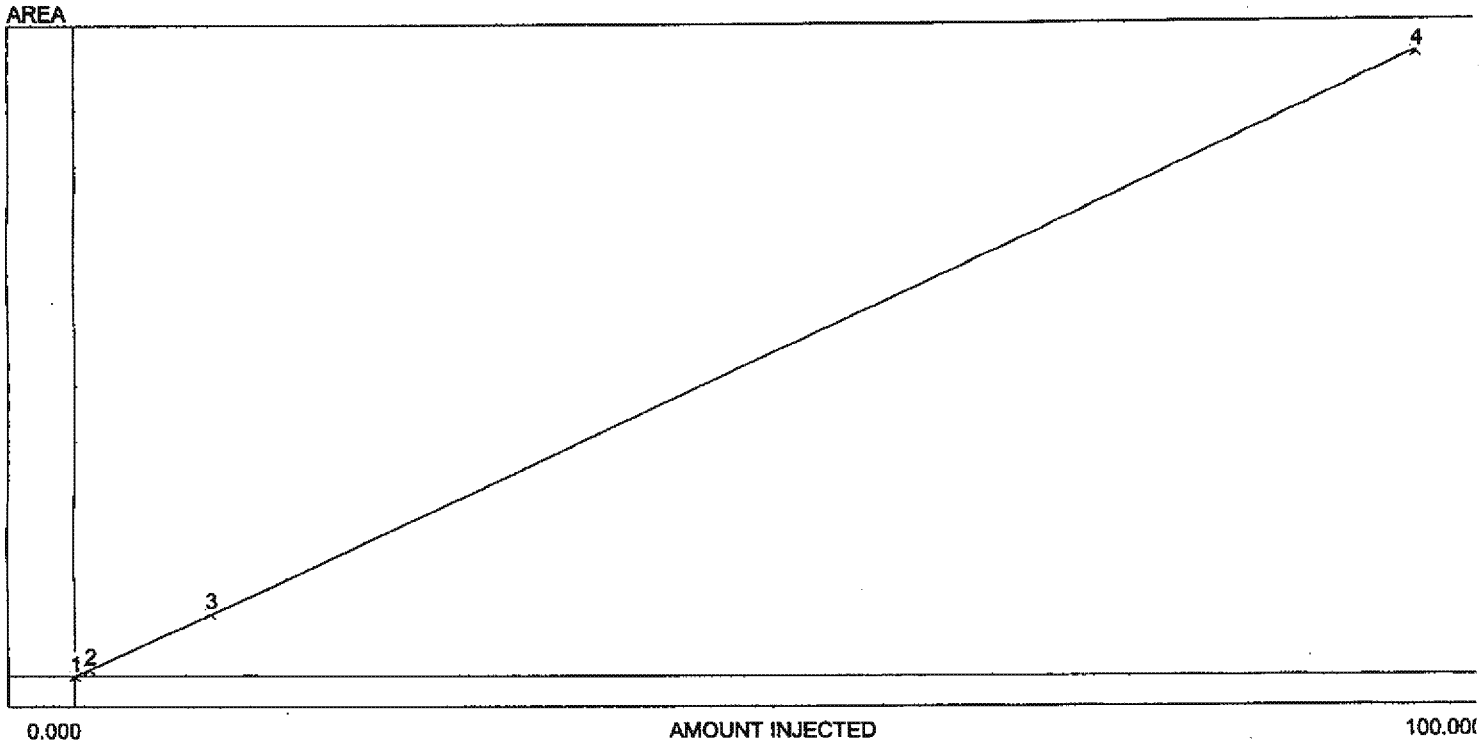
APPENDICES

APPENDIX A

Calibration Data

ak	Name	Start	End	Calibration	Int.Std	Units
	Dead Vol / Air	0.000	0.350		0.000	
	Ambient H2O	0.350	0.500		0.000	
	Ethylene Oxide	0.500	0.600	C:\peak359\1Ster	0.000	16.ppm
	Acetaldehyde	0.600	0.800		0.000	
	CO2	0.800	1.000		0.000	

ibration file: C:\peak359\1SterWB2016.cal

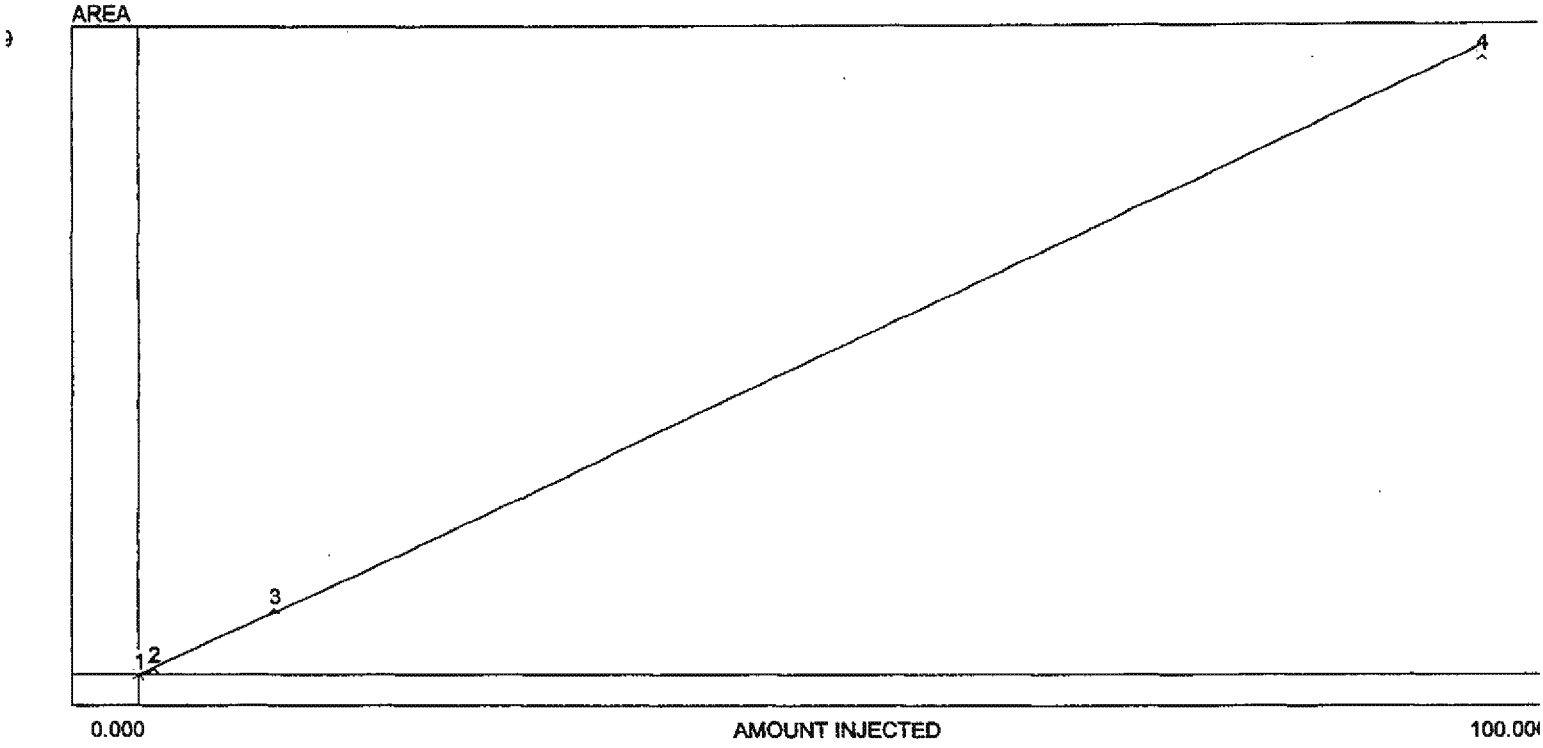


ı slope of curve: 0.43
xis intercept: 0.00
earity: 1.00
nber of levels: 4
'rel SD of CF's: 0.2/66.7
).4316X
1.0000
:t calibrated: Fri Dec 02 08:01:11 2016

Area/ht.	Amount	CF	Current	Previous #1	Previous #2
0.000	0.000	0.000	0.000	N/A	N/A
0.470	1.100	0.427	0.470	N/A	N/A
4.420	10.100	0.438	4.420	N/A	N/A
43.000	100.000	0.430	43.000	N/A	N/A

ak	Name	Start	End	Calibration	Int.Std	Units
	Dead Vol / Air	0.000	0.350		0.000	
	Ambient H2O	0.350	0.500		0.000	
	Ethylene Oxide	0.500	0.600	C:\peak359\2Ster	0.000	16.ppm
	Acetaldehyde	0.600	0.800		0.000	
	CO2	0.800	1.000		0.000	

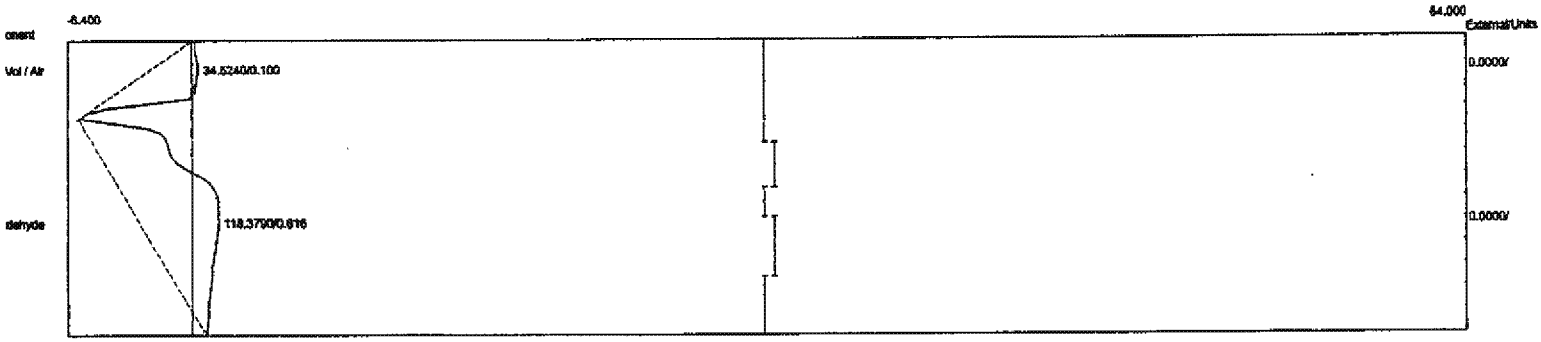
libration file: C:\peak359\2SterWB2016.cal



ı slope of curve: 1.82
uxis intercept: 0.00
earity: 1.00
nber of levels: 4
/rel SD of CF's: 0.9/67.0
1.8223X
0.9999
it calibrated: Fri Dec 02 08:00:23 2016

Area/ht.	Amount	CF	Current	Previous #1	Previous #2
0.000	0.000	0.000	0.000	N/A	N/A
1.910	1.100	1.736	1.910	N/A	N/A
19.600	10.100	1.941	19.600	N/A	N/A
179.000	100.000	1.790	179.000	N/A	N/A

Client: Sterigenics - Willowbrook 1
Client ID: PreCal
ıalysis date: 12/12/2016 14:15:28
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E.CHR (c:\peak359)
Sample: Ambient Background
Operator: D. Kremer

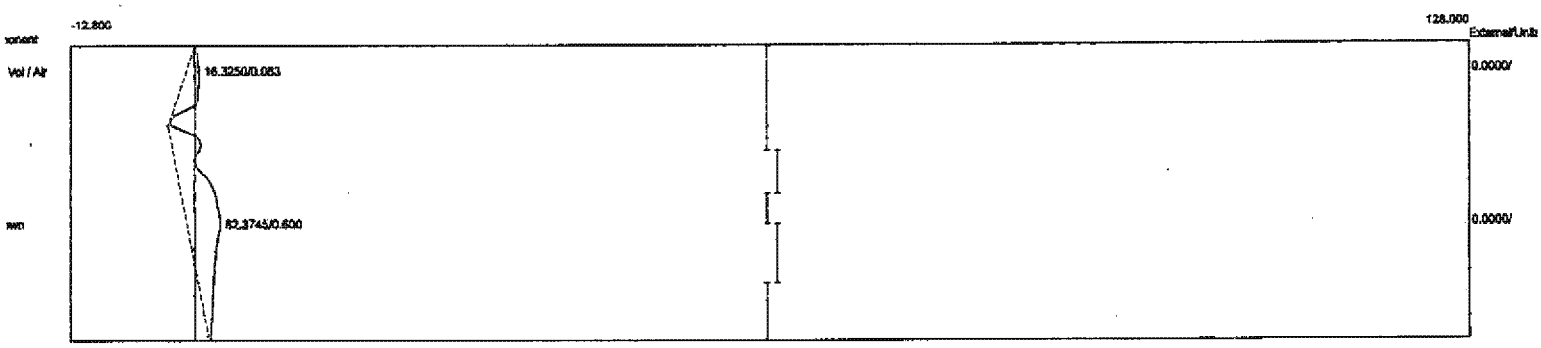


Component	Retention	Area	External	Units
ad Vol / Air	0.100	34.5240	0.0000	
etaldehyde	0.616	118.3790	0.0000	
		152.9030	0.0000	

APPENDIX B

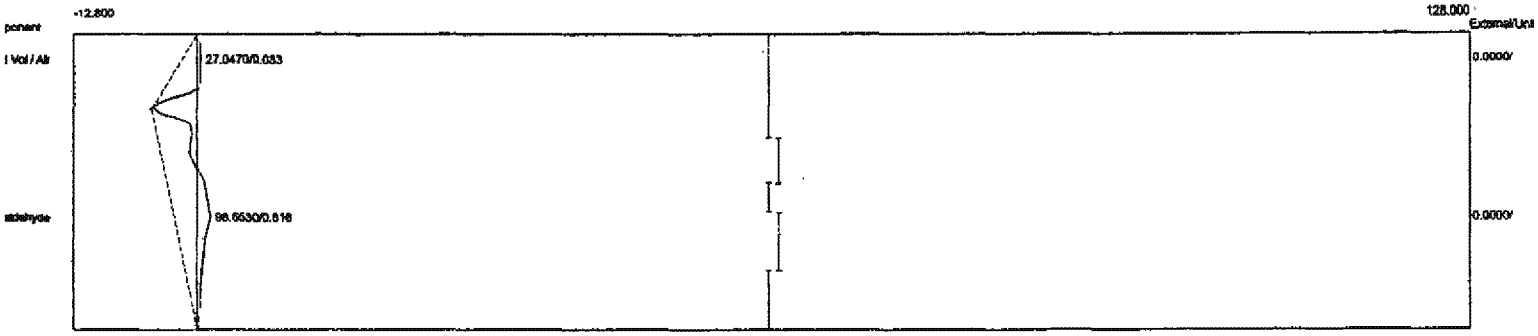
Run#1 Chromatograms

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
ıalysis date: 12/12/2016 14:32:37
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E01.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



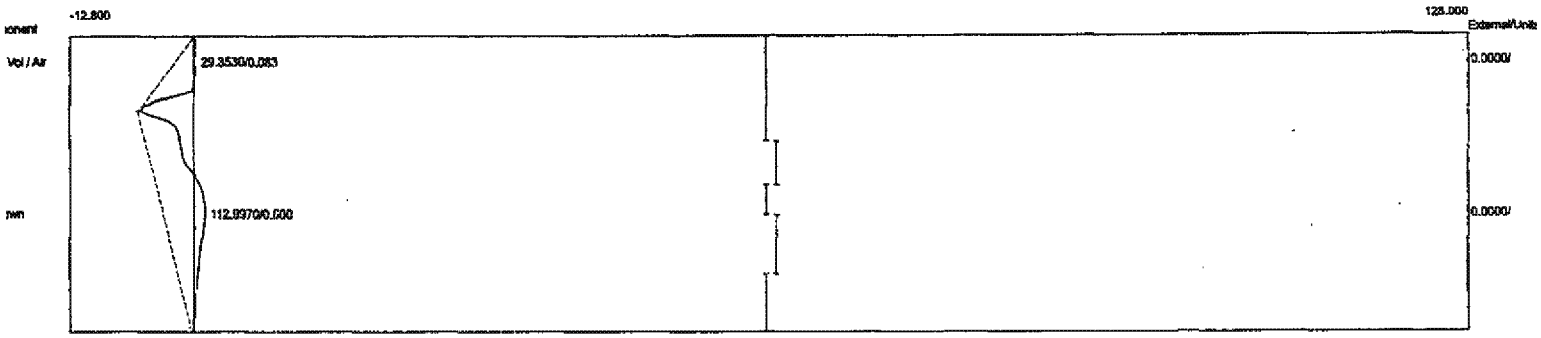
Component	Retention	Area	External	Units
ad Vol / Air	0.083	16.3250	0.0000	
		16.3250	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:34:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster1WB2016-1E02.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



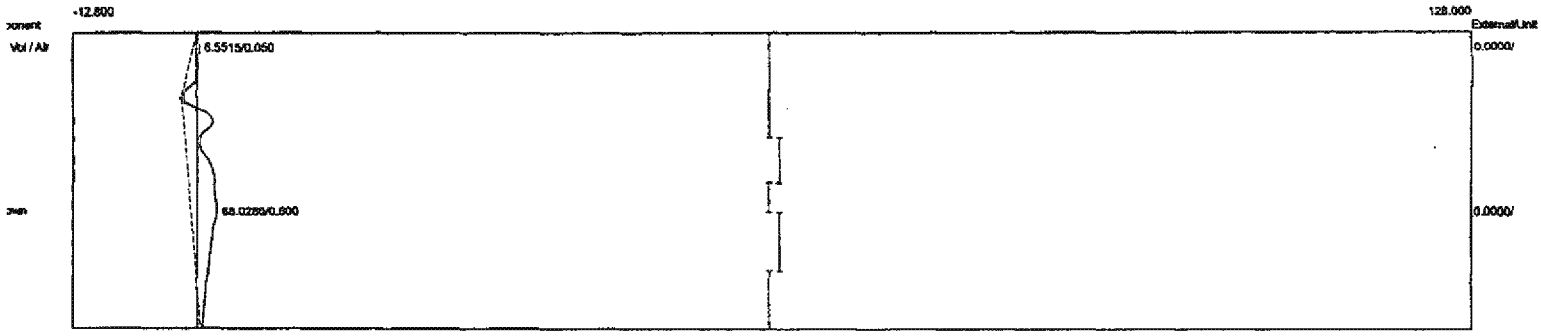
Component	Retention	Area	External	Units
ad Vol / Air	0.083	27.0470	0.0000	
etaldehyde	0.616	98.6530	0.0000	
		125.7000	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:35:21
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E03.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



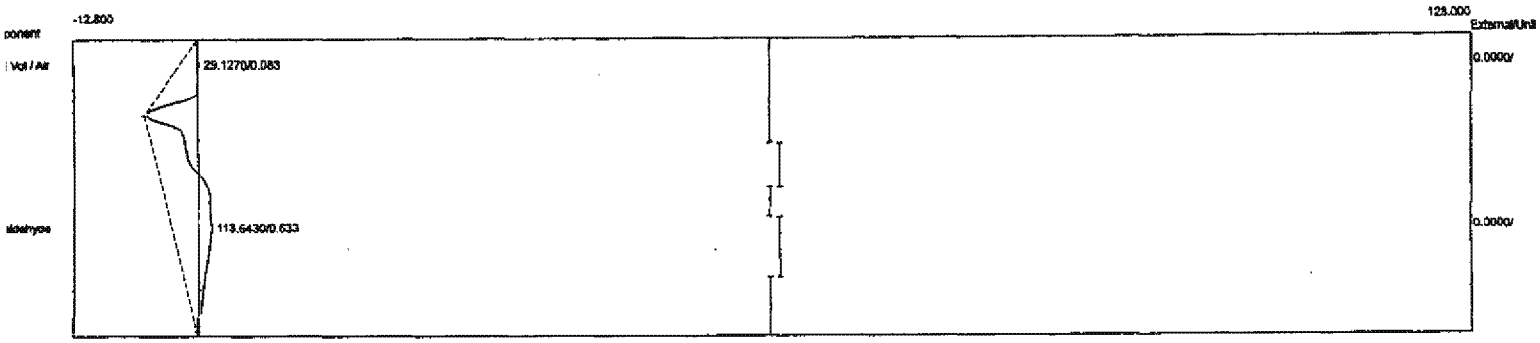
Component	Retention	Area	External	Units
ad Vol / Air	0.083	29.3530	0.0000	
		29.3530	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:36:33
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E04.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



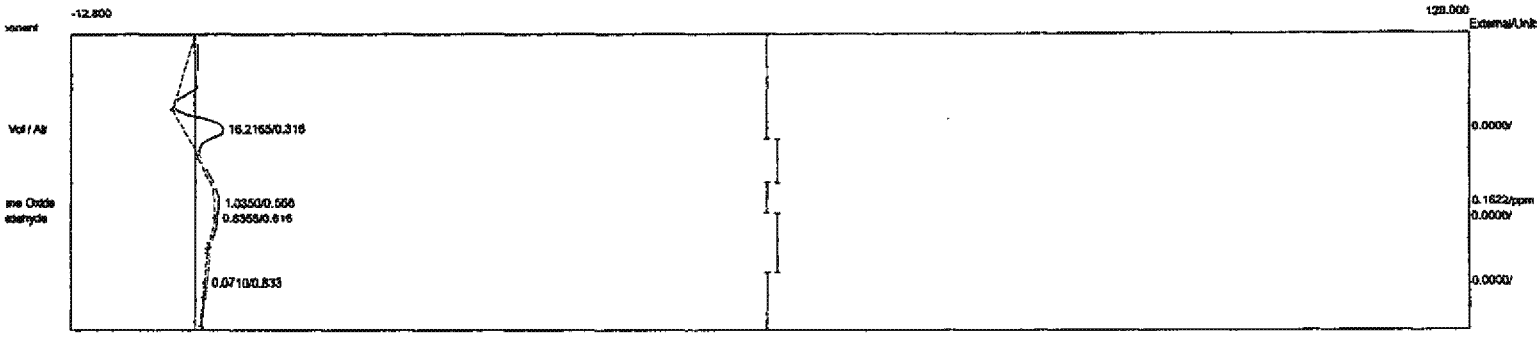
Component	Retention	Area	External	Units
ad Vol / Air	0.050	6.5515	0.0000	
		6.5515	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:37:45
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E05.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



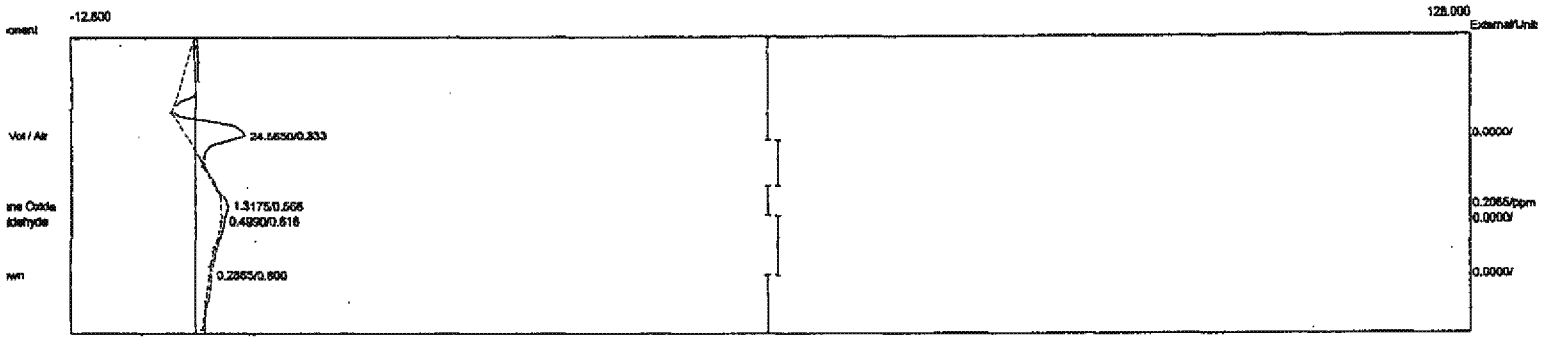
Component	Retention	Area	External	Units
ad Vol / Air	0.083	29.1270	0.0000	
etaldehyde	0.633	113.6430	0.0000	
		142.7700	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:39:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E06.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



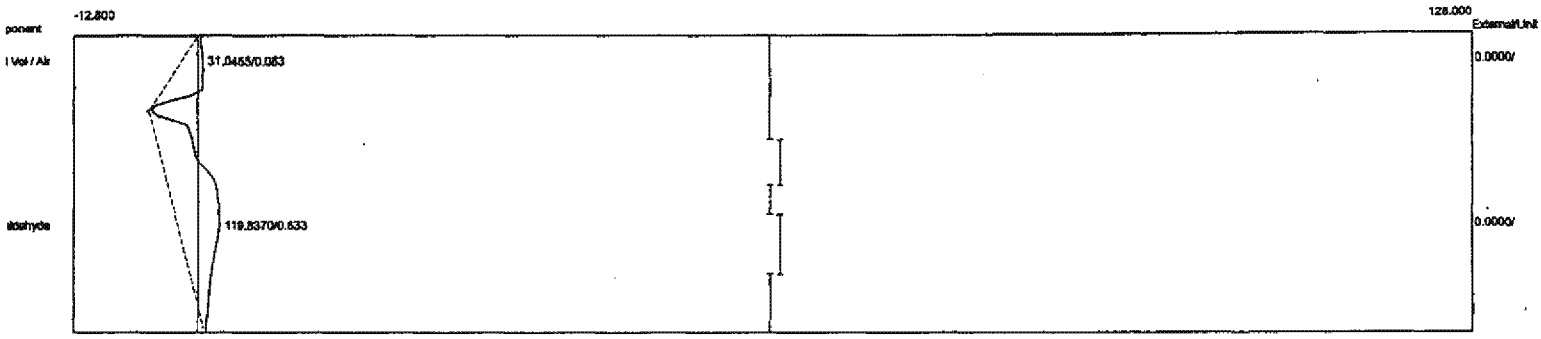
Component	Retention	Area	External	Units
ad Vol / Air	0.316	16.2165	0.0000	
ylene Oxide	0.566	1.0350	0.1622	ppm
etaldehyde	0.616	0.6355	0.0000	
2	0.833	0.0710	0.0000	
		17.9580	0.1622	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
ıalysis date: 12/12/2016 14:40:18
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E07.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



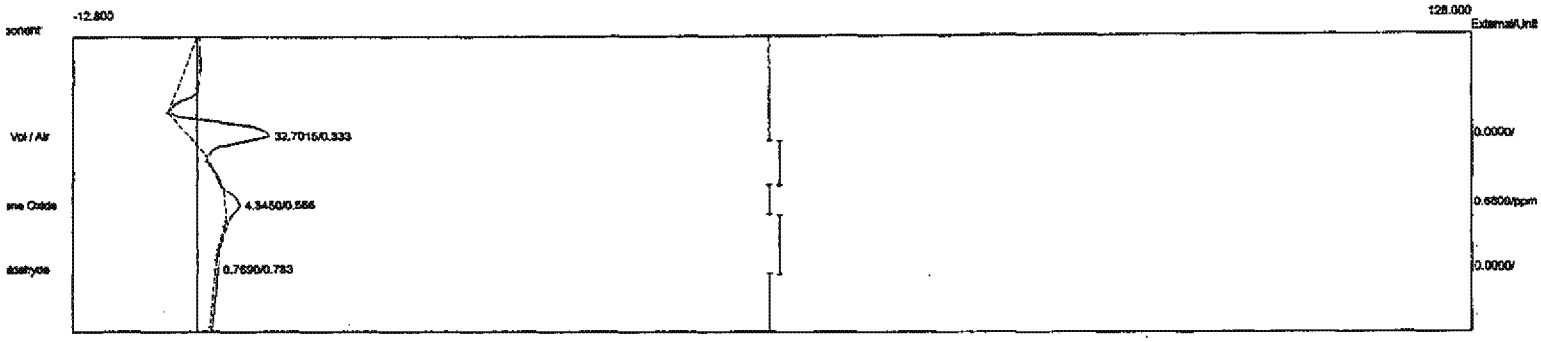
Component	Retention	Area	External	Units
ad Vol / Air	0.333	24.6650	0.0000	
ıylene Oxide	0.566	1.3175	0.2065	ppm
ɜtaldehyde	0.616	0.4990	0.0000	
		26.4815	0.2065	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:41:35
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E08.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



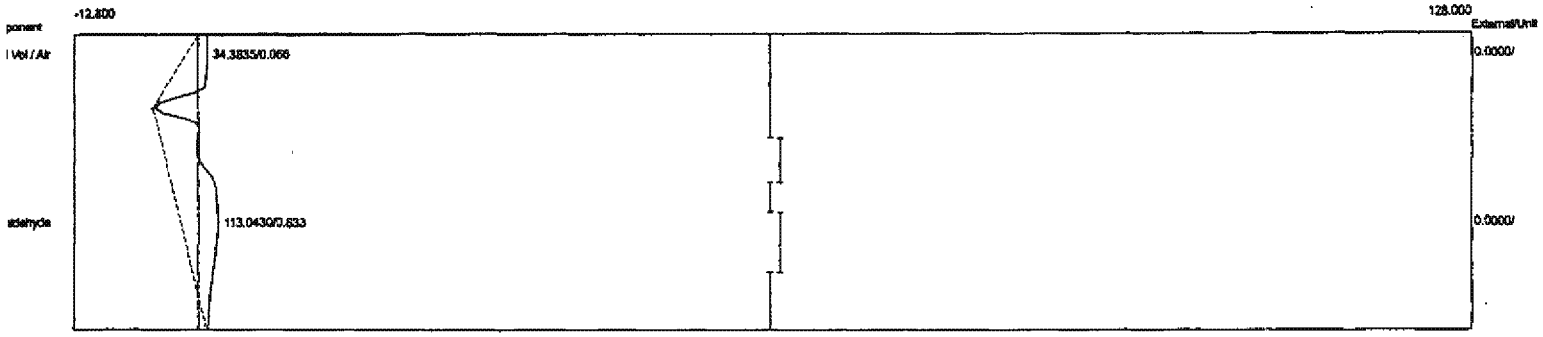
Component	Retention	Area	External	Units
ad Vol / Air	0.083	31.0455	0.0000	
etaldehyde	0.633	119.8370	0.0000	
		150.8825	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:42:48
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E09.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



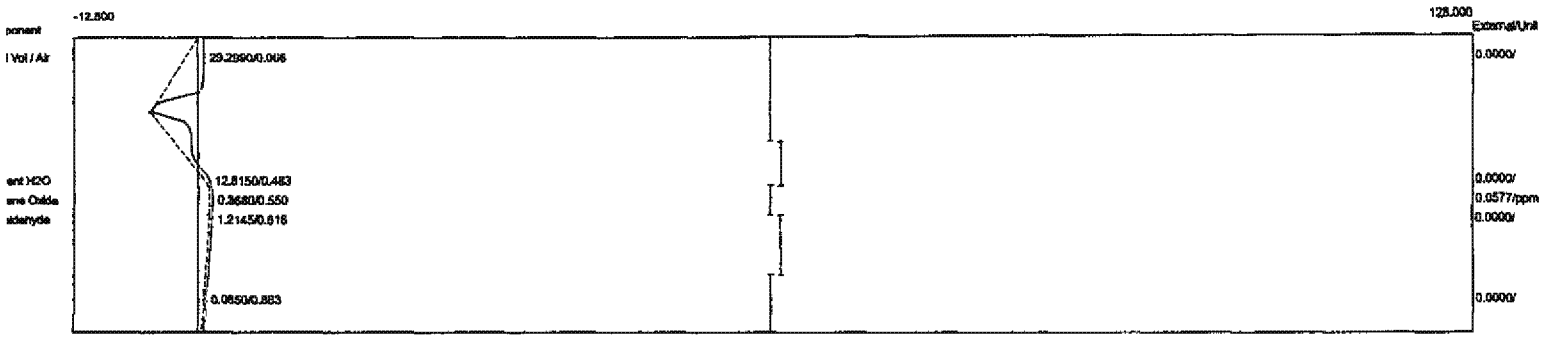
Component	Retention	Area	External	Units
ad Vol / Air	0.333	32.7015	0.0000	
ıylene Oxide	0.566	4.3450	0.6809	ppm
etaldehyde	0.783	0.7690	0.0000	
		37.8155	0.6809	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:44:00
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E10.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



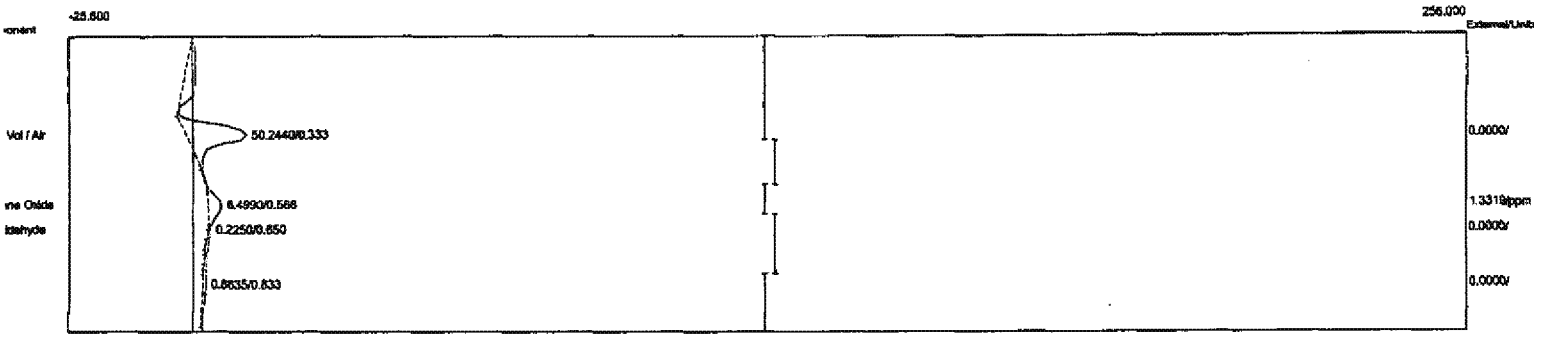
Component	Retention	Area	External	Units
ad Vol / Air	0.066	34.3835	0.0000	
etaldehyde	0.633	113.0430	0.0000	
		147.4265	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:45:13
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E11.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



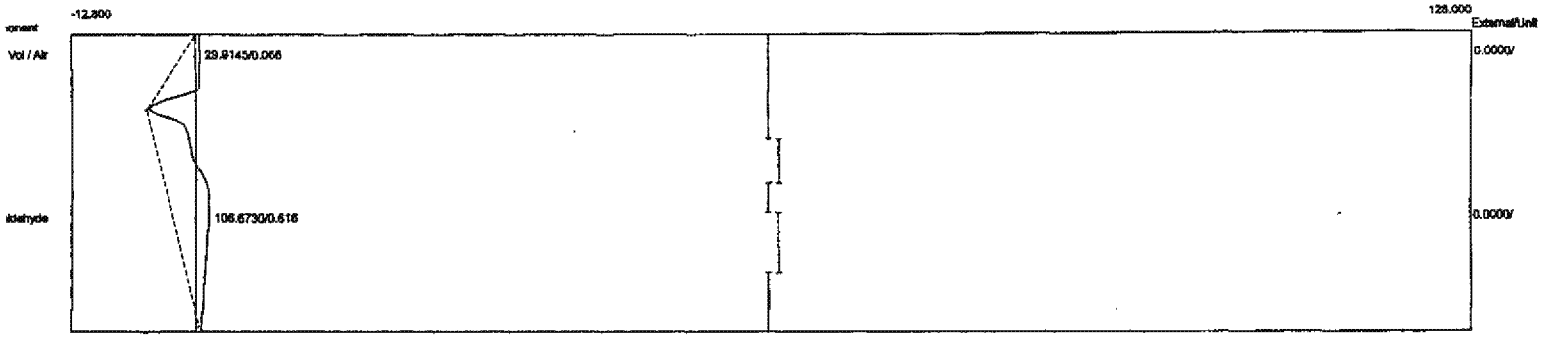
Component	Retention	Area	External	Units
ad Vol / Air	0.066	29.2990	0.0000	
ıbient H2O	0.483	12.8150	0.0000	
ıylene Oxide	0.550	0.3680	0.0577	ppm
etaldehyde	0.616	1.2145	0.0000	
)2	0.883	0.0850	0.0000	
		43.7815	0.0577	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
ıalysis date: 12/12/2016 14:46:44
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E12.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



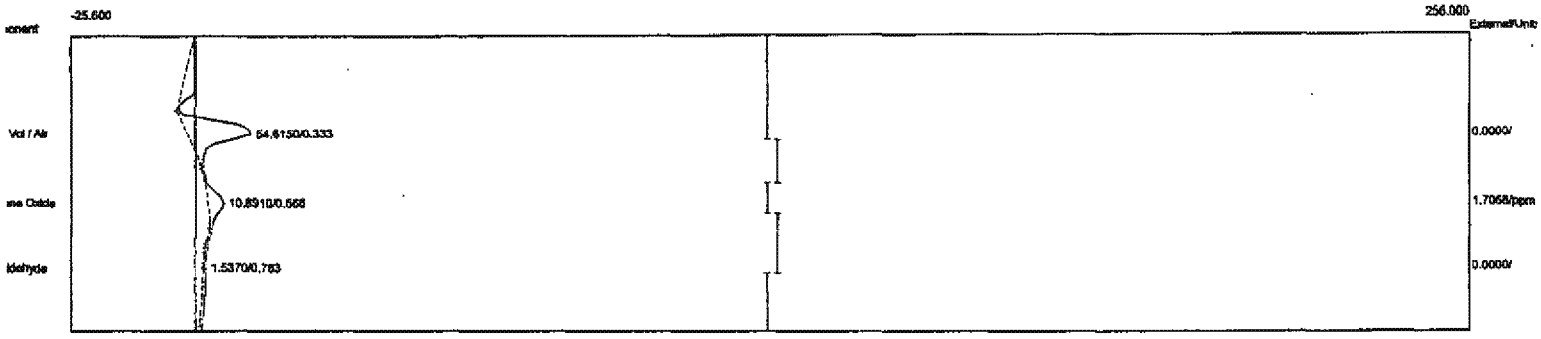
Component	Retention	Area	External	Units
ad Vol / Air	0.333	50.2440	0.0000	
ıylene Oxide	0.566	8.4990	1.3319	ppm
etaldehyde	0.650	0.2250	0.0000	
ı2	0.833	0.8635	0.0000	
		59.8315	1.3319	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
nalysis date: 12/12/2016 14:48:15
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E13.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.066	29.9145	0.0000	
etaldehyde	0.616	106.6730	0.0000	
		136.5875	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#1Exh
ıalysis date: 12/12/2016 14:49:35
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-1E14.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer

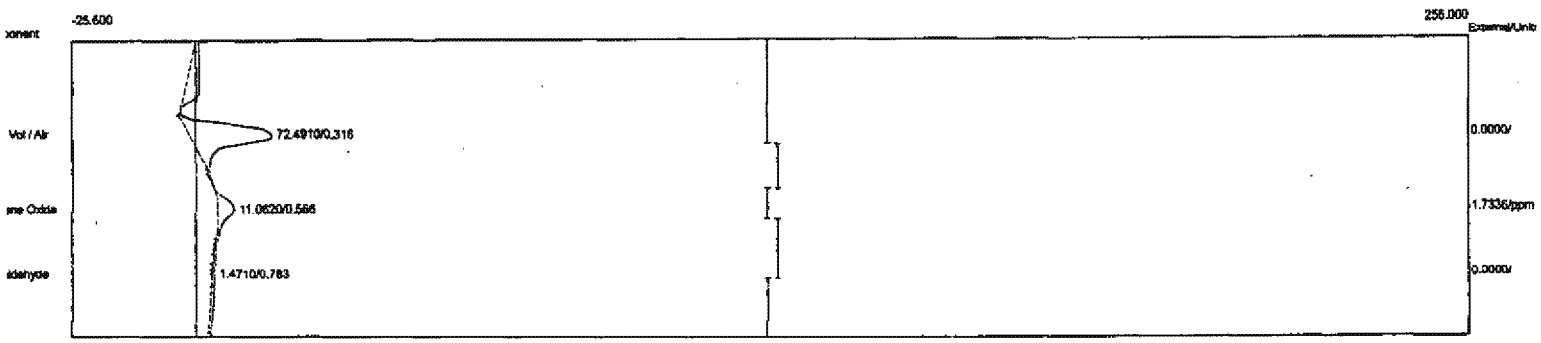


Component	Retention	Area	External	Units
ad Vol / Air	0.333	54.6150	0.0000	
ıylene Oxide	0.566	10.8910	1.7068	ppm
etaldehyde	0.783	1.5370	0.0000	
		67.0430	1.7068	

APPENDIX C

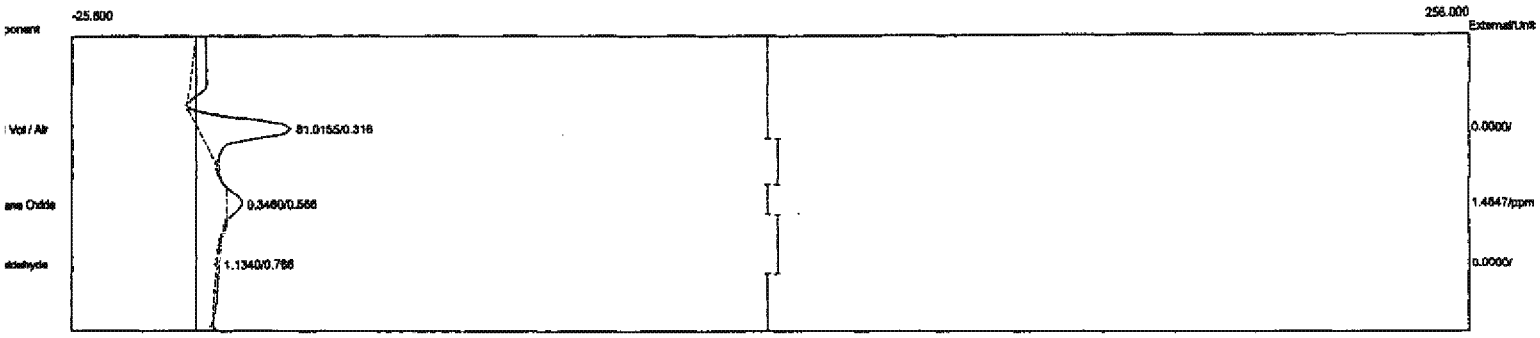
Run#2 Chromatograms

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
ıalysis date: 12/12/2016 15:01:53
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E01.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



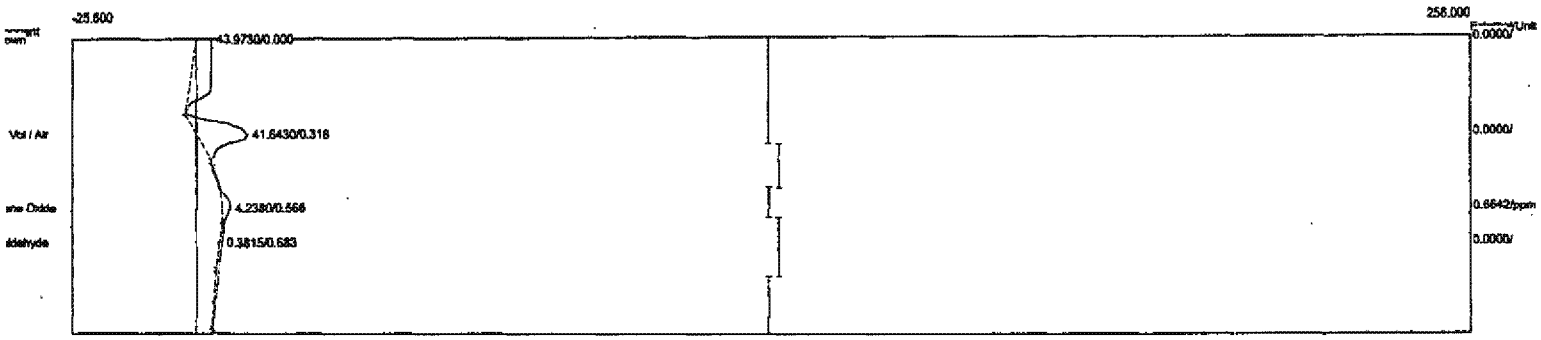
Component	Retention	Area	External	Units
ad Vol / Air	0.316	72.4910	0.0000	
ıylene Oxide	0.566	11.0620	1.7336	ppm
etaldehyde	0.783	1.4710	0.0000	
		85.0240	1.7336	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
nalysis date: 12/12/2016 15:03:31
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E02.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



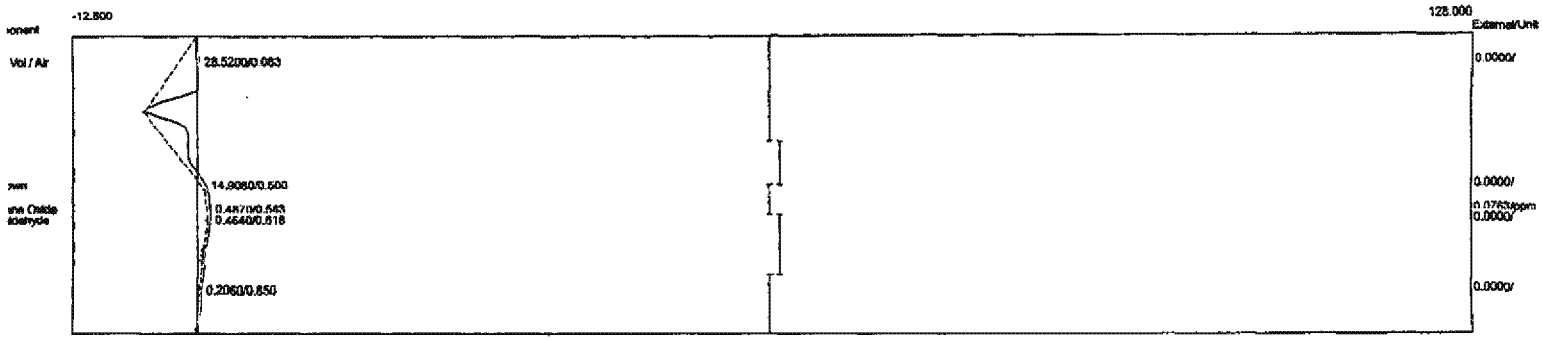
Component	Retention	Area	External	Units
ad Vol / Air	0.316	81.0155	0.0000	
ıylene Oxide	0.566	9.3460	1.4647	ppm
etaldehyde	0.766	1.1340	0.0000	
		91.4955	1.4647	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
nalysis date: 12/12/2016 15:04:46
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E03.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



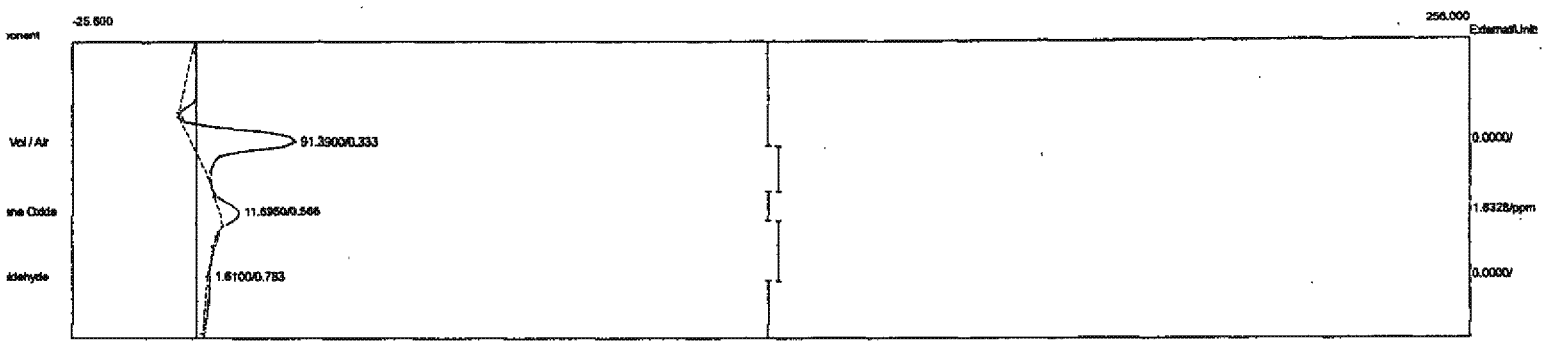
Component	Retention	Area	External	Units
ad Vol / Air	0.316	41.6430	0.0000	
ıylene Oxide	0.566	4.2380	0.6642	ppm
etaldehyde	0.683	0.3815	0.0000	
		46.2625	0.6642	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
nalysis date: 12/12/2016 15:06:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E04.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



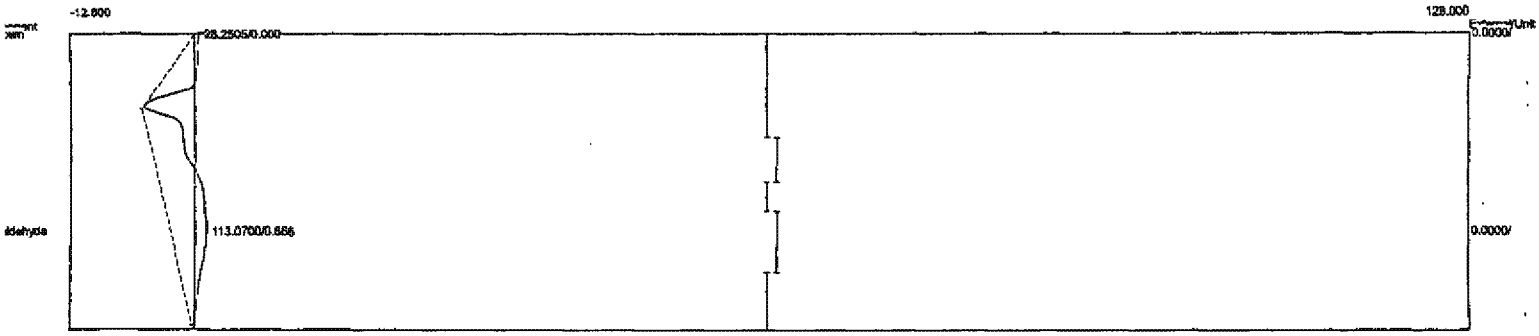
Component	Retention	Area	External	Units
ad Vol / Air	0.083	28.5200	0.0000	
ylene Oxide	0.583	0.4870	0.0763	ppm
etaldehyde	0.616	0.4640	0.0000	
2	0.850	0.2060	0.0000	
		29.6770	0.0763	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
nalysis date: 12/12/2016 15:07:25
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E05.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



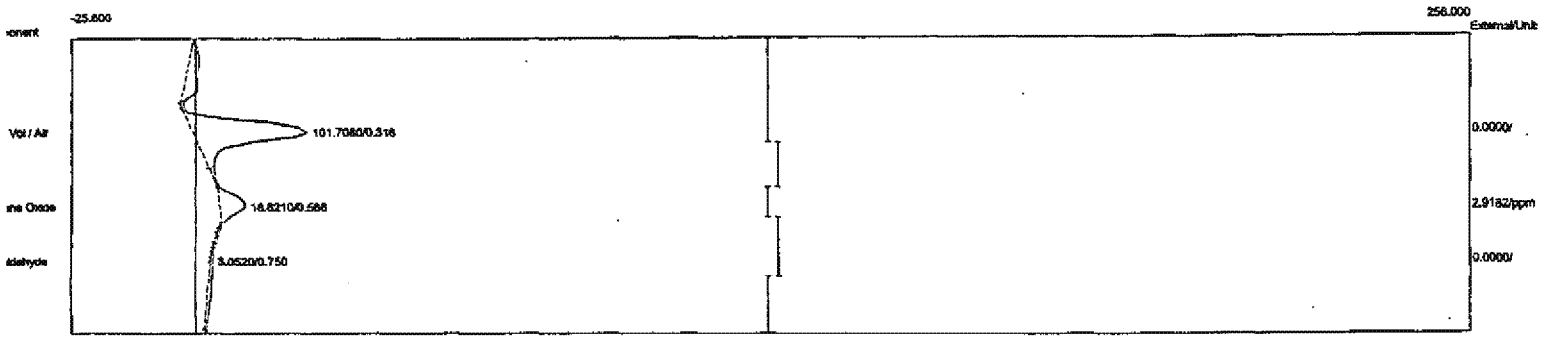
Component	Retention	Area	External	Units
ad Vol / Air	0.333	91.3900	0.0000	
ylene Oxide	0.566	11.6950	1.8328	ppm
staldehyde	0.783	1.6100	0.0000	
		104.6950	1.8328	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
nalysis date: 12/12/2016 15:08:38
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E06.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



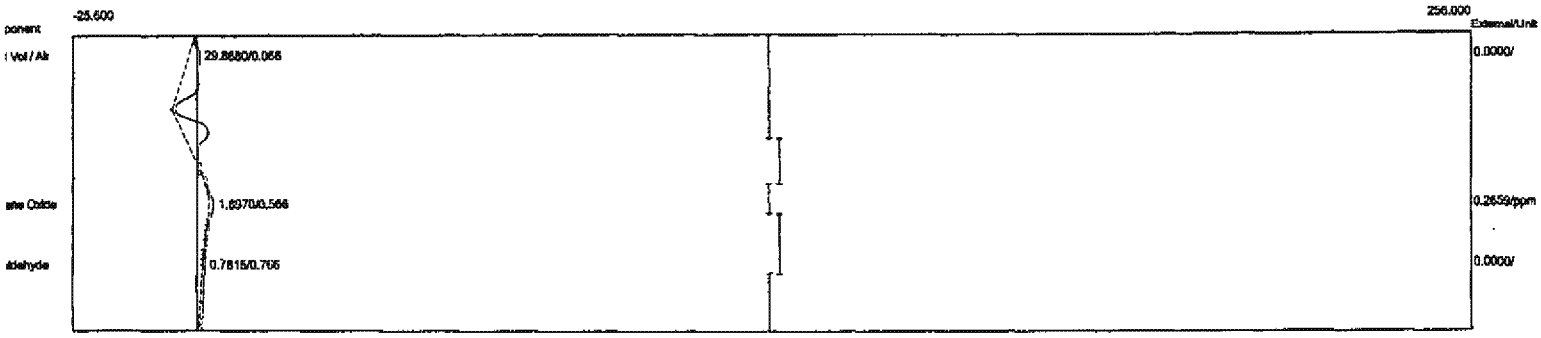
Component	Retention	Area	External	Units
etaldehyde	0.666	113.0700	0.0000	
		113.0700	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
ıalysis date: 12/12/2016 15:09:46
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E07.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



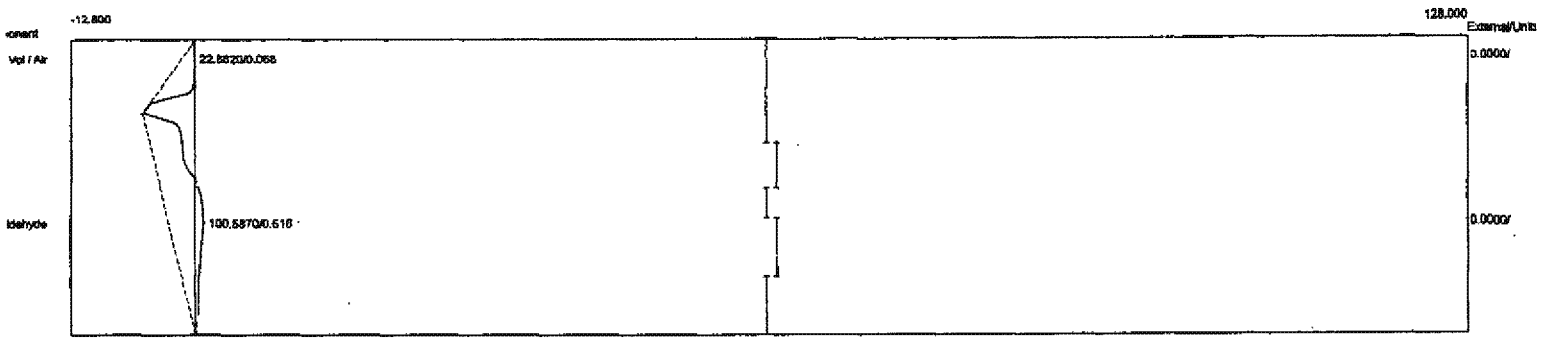
Component	Retention	Area	External	Units
ad Vol / Air	0.316	101.7080	0.0000	
ıylene Oxide	0.566	18.6210	2.9182	ppm
etaldehyde	0.750	3.0520	0.0000	
		123.3810	2.9182	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
nalysis date: 12/12/2016 15:11:10
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E08.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



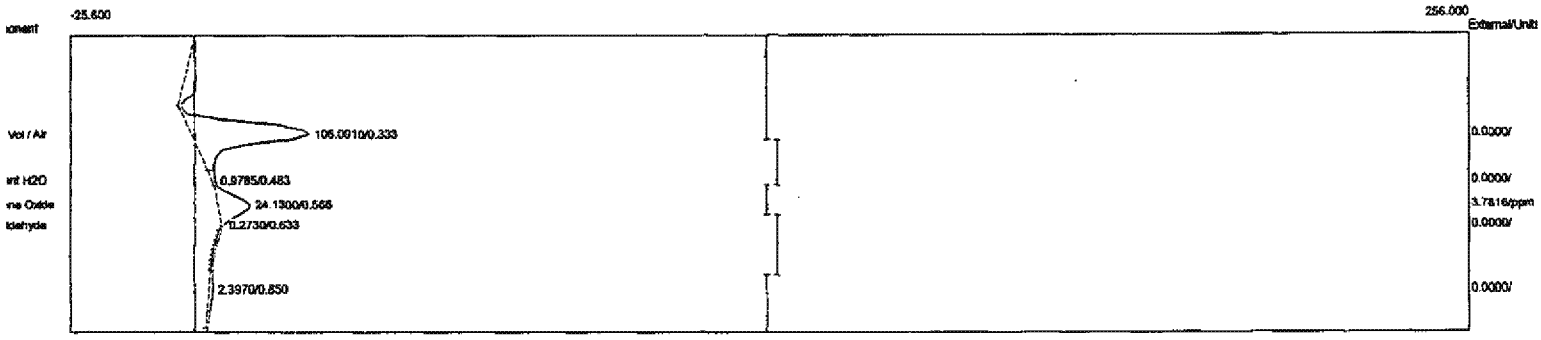
Component	Retention	Area	External	Units
ad Vol / Air	0.066	29.8680	0.0000	
ıylene Oxide	0.566	1.6970	0.2659	ppm
etaldehyde	0.766	0.7815	0.0000	
		32.3465	0.2659	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
nalysis date: 12/12/2016 15:12:28
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E09.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



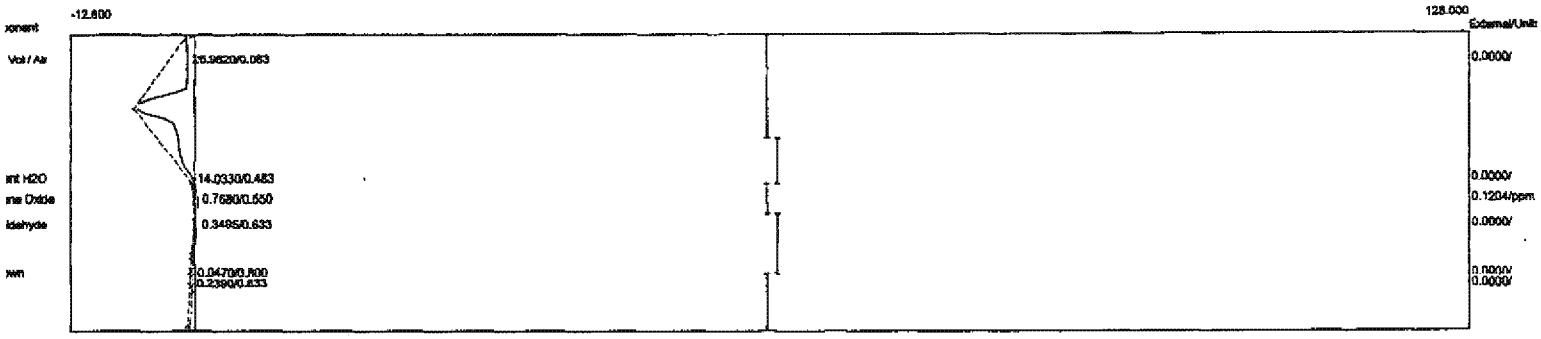
Component	Retention	Area	External	Units
ad Vol / Air	0.066	22.8820	0.0000	
etaldehyde	0.616	100.5870	0.0000	
		123.4690	0.0000	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
ıalysis date: 12/12/2016 15:13:41
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E10.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



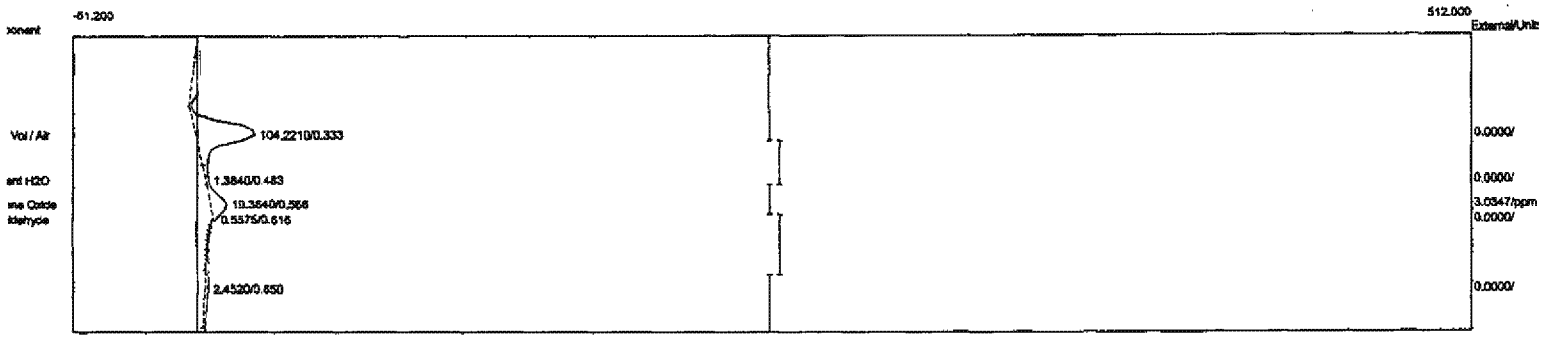
Component	Retention	Area	External	Units
ad Vol / Air	0.333	106.0910	0.0000	
ıbient H2O	0.483	0.9785	0.0000	
ıylene Oxide	0.566	24.1300	3.7816	ppm
ɜtaldehyde	0.633	0.2730	0.0000	
ı2	0.850	2.3970	0.0000	
		133.8695	3.7816	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
ıalysis date: 12/12/2016 15:15:13
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E11.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.083	26.9820	0.0000	
ıbient H2O	0.483	14.0330	0.0000	
ıylene Oxide	0.550	0.7680	0.1204	ppm
etaldehyde	0.633	0.3495	0.0000	
ı2	0.833	0.2390	0.0000	
		42.3715	0.1204	

Client: Sterigenics - Willowbrook 1
Client ID: Run#2Exh
ıalysis date: 12/12/2016 15:16:33
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster1WB2016-2E12.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer

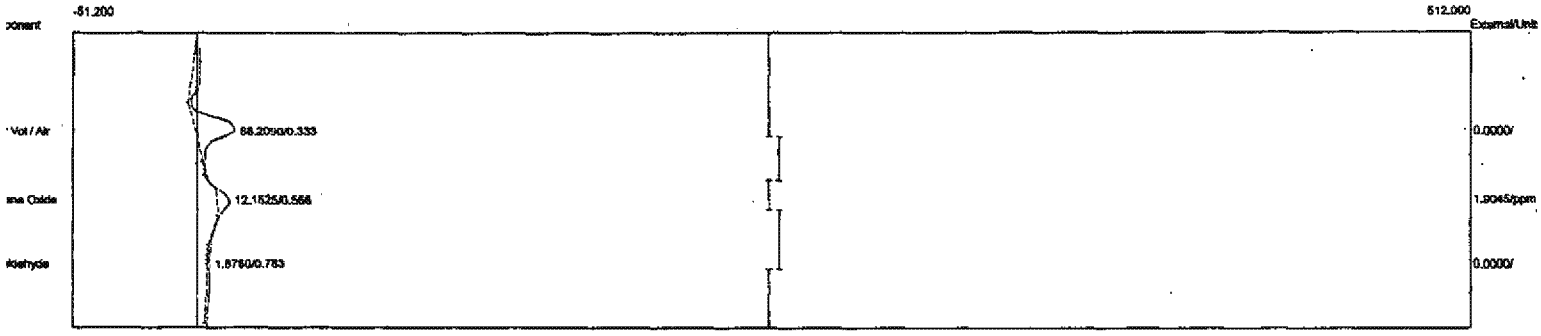


Component	Retention	Area	External	Units
ad Vol / Air	0.333	104.2210	0.0000	
ıbient H2O	0.483	1.3840	0.0000	
ıylene Oxide	0.566	19.3640	3.0347	ppm
etaldehyde	0.616	0.5575	0.0000	
ı2	0.850	2.4520	0.0000	
		127.9785	3.0347	

APPENDIX D

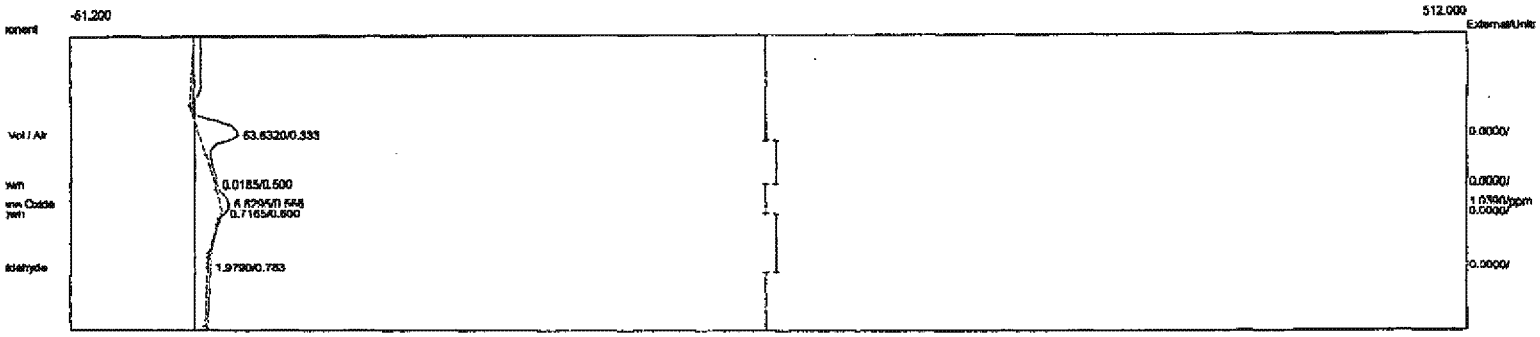
Run#3 Chromatograms

Client: Sterigenics - Willowbrook 1
Client ID: Run#3Exh
nalysis date: 12/12/2016 15:41:52
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-3E01.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



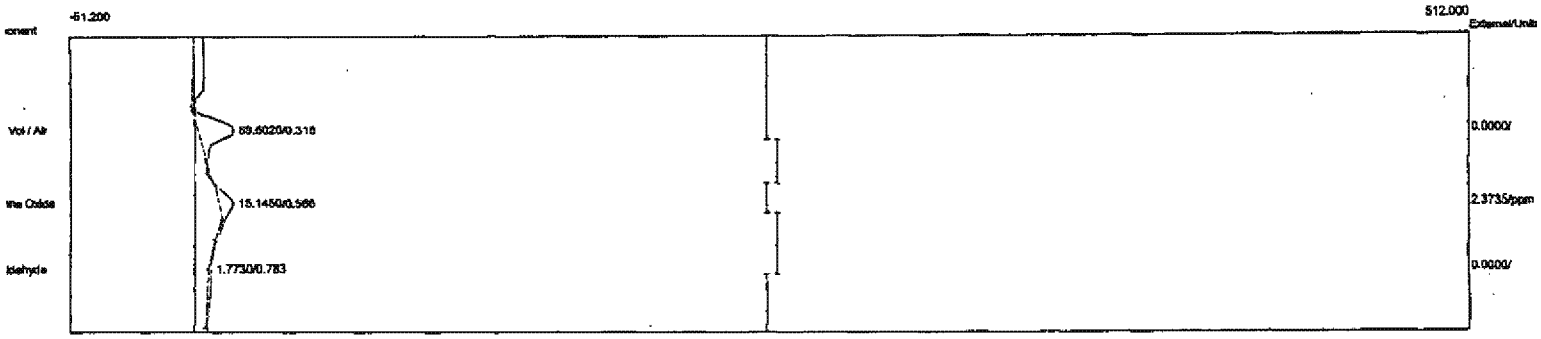
Component	Retention	Area	External	Units
ad Vol / Air	0.333	68.2090	0.0000	
ylene Oxide	0.566	12.1525	1.9045	ppm
etaldehyde	0.783	1.8760	0.0000	
		82.2375	1.9045	

Client: Sterigenics - Willowbrook 1
Client ID: Run#3Exh
ıalysis date: 12/12/2016 15:43:18
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-3E02.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



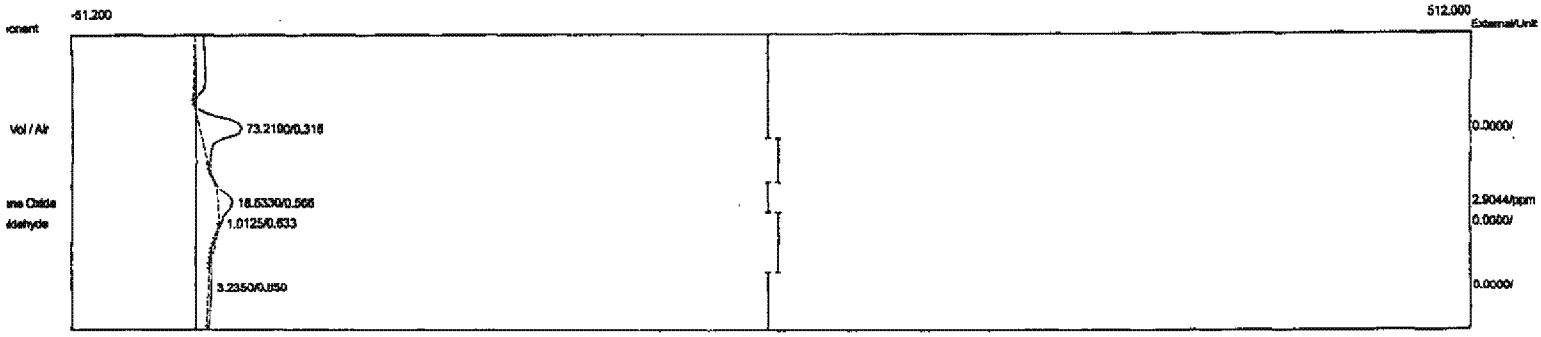
Component	Retention	Area	External	Units
ad Vol / Air	0.333	63.8320	0.0000	
ıylene Oxide	0.566	6.6295	1.0390	ppm
ɜtaldehyde	0.783	1.9790	0.0000	
		72.4405	1.0390	

Client: Sterigenics - Willowbrook 1
Client ID: Run#3Exh
ıalysis date: 12/12/2016 15:44:38
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-3E03.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



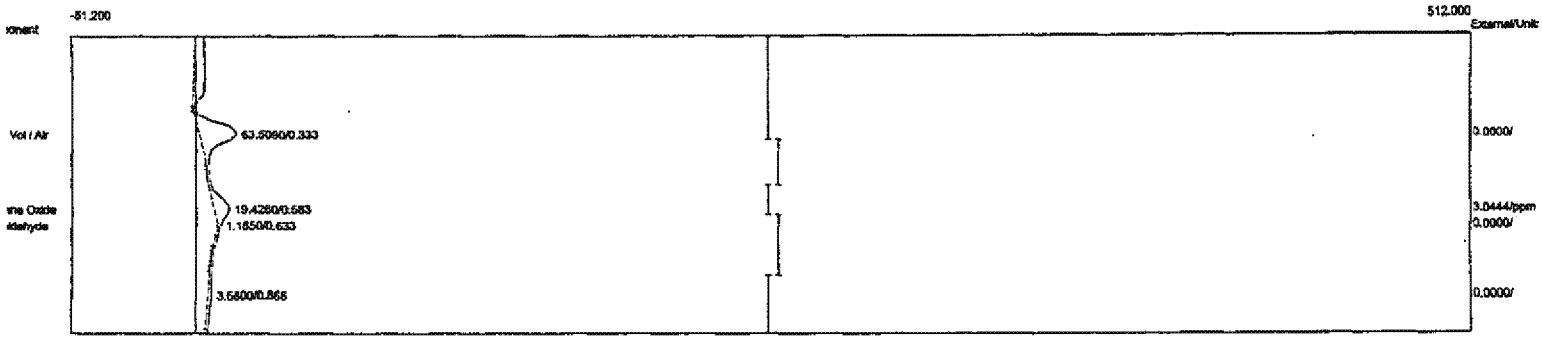
Component	Retention	Area	External	Units
ad Vol / Air	0.316	59.6020	0.0000	
ıylene Oxide	0.566	15.1450	2.3735	ppm
ɜtaldehyde	0.783	1.7730	0.0000	
		76.5200	2.3735	

Client: Sterigenics - Willowbrook 1
Client ID: Run#3Exh
nalysis date: 12/12/2016 15:45:59
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-3E04.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



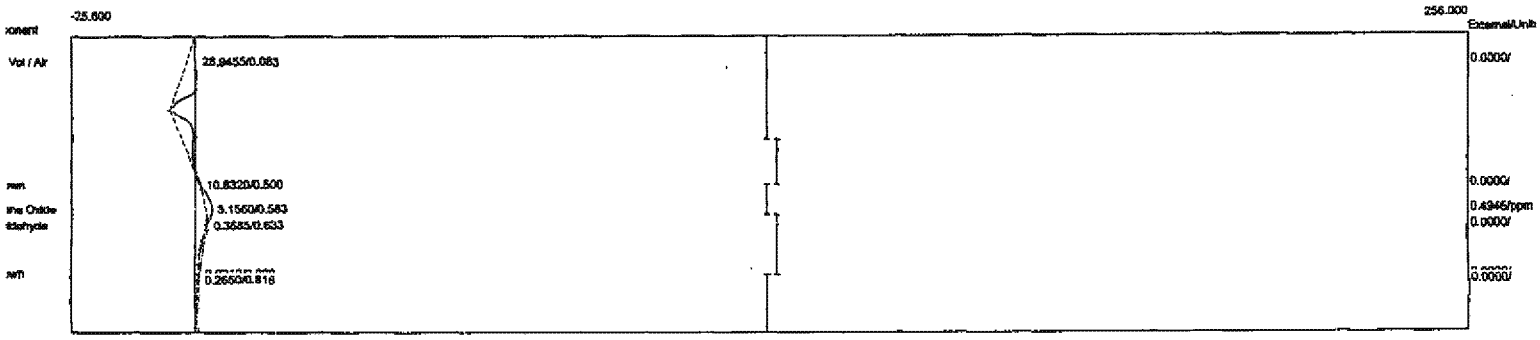
Component	Retention	Area	External	Units
ad Vol / Air	0.316	73.2190	0.0000	
ylene Oxide	0.566	18.5330	2.9044	ppm
etaldehyde	0.633	1.0125	0.0000	
12	0.850	3.2350	0.0000	
		95.9995	2.9044	

Client: Sterigenics - Willowbrook 1
Client ID: Run#3Exh
nalysis date: 12/12/2016 15:47:19
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-3E05.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



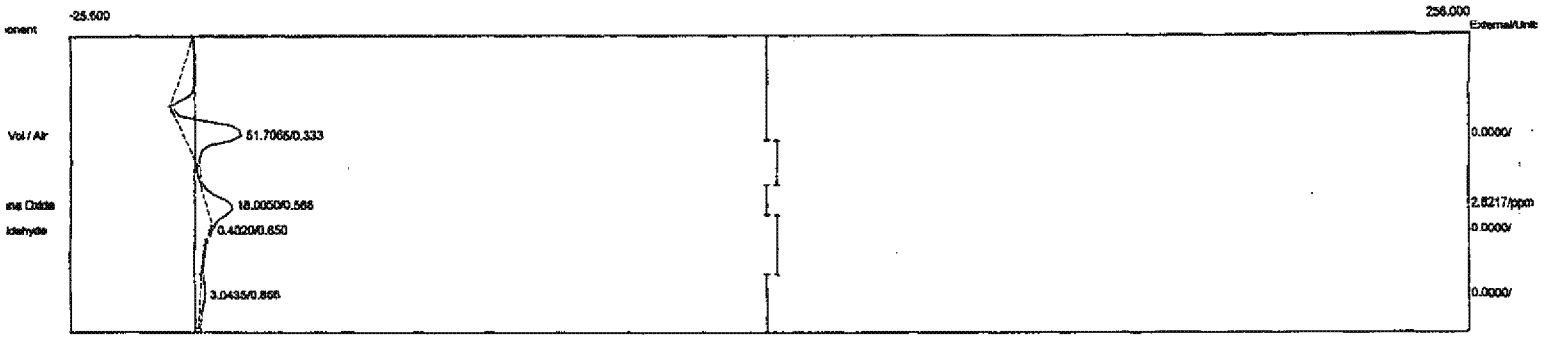
Component	Retention	Area	External	Units
ad Vol / Air	0.333	63.5090	0.0000	
ylene Oxide	0.583	19.4260	3.0444	ppm
etaldehyde	0.633	1.1650	0.0000	
2	0.866	3.6800	0.0000	
		87.7800	3.0444	

Client: Sterigenics - Willowbrook 1
Client ID: Run#3Exh
nalysis date: 12/12/2016 15:48:41
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-3E06.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.083	28.9455	0.0000	
ylene Oxide	0.583	3.1560	0.4946	ppm
etaldehyde	0.633	0.3685	0.0000	
2	0.816	0.2650	0.0000	
		32.7350	0.4946	

Client: Sterigenics - Willowbrook 1
Client ID: Run#3Exh
ıalysis date: 12/12/2016 15:50:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster1WB2016-3E07.CHR (c:\peak359)
Sample: DEOXX Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.333	51.7065	0.0000	
ıylene Oxide	0.566	18.0050	2.8217	ppm
etaldehyde	0.650	0.4020	0.0000	
ı2	0.866	3.0435	0.0000	
		73.1570	2.8217	

APPENDIX E

Field Data and Calculation Worksheets

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Run #1 - Chamber 2 (DEOXX Scrubber Outlet)
Sterigenics, Inc. - Willowbrook 1
December 12, 2016

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.01	0.1000	42.5	0.01
0.015	0.1225	39.7	0.01
0.015	0.1225	37.5	0.01
0.01	0.1000	41.2	0.01
0.0075	0.0866	35.9	0.01
0.0075	0.0866	37.1	0.16
0.005	0.0707	33.3	0.21
0.005	0.0707	36.4	0.01
0.005	0.0707	34.7	0.68
0.005	0.0707	35.3	0.01
0.0025	0.0500	36.6	0.06
0.0025	0.0500	34.4	1.33
0.0025	0.0500	35.7	0.01
0.0025	0.0500	33.1	1.71
Average =			
0.0068	0.0824	36.7	**0.3021**
	=	497	degR

1-%H2O =	0.97	
mw =	28.54	
stack ID =	6	in.
stack area =	0.196	sq. in.
press =	29.20	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	5.4	ft/sec
Flow =	**63.8**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0000022**	**lbs/min**
evac start =	1431	
evac stop =	1450	
min/cycle =	19	
EtO Emissions =	**0.0000419**	**lbs/cycle**

INLET CALCULATION:

Pre-Evac:				Post-Evac:			
	V =	1350	ft3		V =	1350	ft3
	P =	14.6	in Hg Abs		P =	3.0	in Hg Abs
	T =	125	degF		T =	125	degF
	R =	10.73			R =	10.73	
	mw =	44.05			mw =	44.05	
	lbs EtO @ 100% =	67.80	lbs		lbs EtO @ 100% =	13.93	lbs

Initial EtO = Scale Wt. =	59.6	lbs
% EtO @ Chamber = Scale Wt. / lbs EtO @ 100% (Pre) =	87.9	%
Final EtO = % EtO @ Chamber X lbs EtO @ 100% (Post) =	12.2	lbs
INLET ETO = Initial EtO - Final EtO =	**47.4**	**lbs**
CONTROL EFFICIENCY =	**99.999912**	**%**

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Run #2 - Chamber 8 (DEOXX Scrubber Outlet)
Sterigenics, Inc. - Willowbrook 1
December 12, 2016

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.01	0.1000	36.1	1.73
0.015	0.1225	37.3	1.46
0.01	0.1000	36.1	0.66
0.01	0.1000	35.2	0.08
0.0075	0.0866	35.9	1.83
0.0075	0.0866	32.9	0.01
0.005	0.0707	34.5	2.92
0.005	0.0707	33.4	0.27
0.005	0.0707	31.7	0.01
0.005	0.0707	34.5	3.78
0.0025	0.0500	31.0	0.12
0.0025	0.0500	32.2	3.03
Average =			
0.0071	0.0842	34.2	**1.325**
	=	494	degR

1-%H2O =	0.97	
mw =	28.54	
stack ID =	6	in.
stack area =	0.196	sq. in.
press =	29.20	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	5.5	ft/sec
Flow =	**65.4**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0000099**	**lbs/min**
evac start =	1500	
evac stop =	1517	
min/cycle =	17	
EtO Emissions =	**0.0001683**	**lbs/cycle**

INLET CALCULATION:

Pre-Evac:				Post-Evac:			
	V =	1456	ft3		V =	1456	ft3
	P =	14.4	in Hg Abs		P =	3.0	in Hg Abs
	T =	125	degF		T =	125	degF
	R =	10.73			R =	10.73	
	mw =	44.05			mw =	44.05	
	lbs EtO @ 100% =	72.12	lbs		lbs EtO @ 100% =	15.03	lbs

Initial EtO = Scale Wt. =	64.2	lbs
% EtO @ Chamber = Scale Wt. / lbs EtO @ 100% (Pre) =	89.0	%
Final EtO = % EtO @ Chamber X lbs EtO @ 100% (Post) =	13.4	lbs
INLET ETO = Initial EtO - Final EtO =	**50.8**	**lbs**
CONTROL EFFICIENCY =	**99.999669**	**%**

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Run #3 - Chamber 3 (DEOXX Scrubber Outlet)
Sterigenics, Inc. - Willowbrook 1
December 12, 2016

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.01	0.1000	47.7	1.90
0.015	0.1225	47.3	1.04
0.01	0.1000	46.6	2.37
0.0075	0.0866	47.3	2.90
0.005	0.0707	48.0	3.04
0.005	0.0707	46.8	0.49
0.0025	0.0500	49.2	2.82
Average =			
0.0079	0.0886	47.6	**2.080**
	=	508	degR

1-%H2O =	0.97	
mw =	28.54	
stack ID =	6	in.
stack area =	0.196	sq. in.
press =	29.20	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	5.9	ft/sec
Flow =	**67.9**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0000162**	**lbs/min**
evac start =	1540	
evac stop =	1551	
min/cycle =	11	
EtO Emissions =	**0.0001777**	**lbs/cycle**

INLET CALCULATION:

Pre-Evac:				Post-Evac:			
	V =	663	ft3		V =	663	ft3
	P =	14.1	in Hg Abs		P =	3.0	in Hg Abs
	T =	125	degF		T =	125	degF
	R =	10.73			R =	10.73	
	mw =	44.05			mw =	44.05	
	lbs EtO @ 100% =	32.16	lbs		lbs EtO @ 100% =	6.84	lbs

Initial EtO = Scale Wt. =	30.1	lbs
% EtO @ Chamber = Scale Wt. / lbs EtO @ 100% (Pre) =	93.6	%
Final EtO = % EtO @ Chamber X lbs EtO @ 100% (Post) =	6.4	lbs
INLET ETO = Initial EtO - Final EtO =	**23.7**	**lbs**
CONTROL EFFICIENCY =	**99.999250**	**%**

APPENDIX F

Gas Certifications

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

600 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-001
Item No.: 02020001310TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CAL4448
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	1.10	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: MT DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	1.	PPM	1.10	PPM	10.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1300 PSIG
Expiration Date: 18Apr2018

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases
00 CAJON BLVD., SAN BERNARDINO, CA 92411
Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-003
Item No.: 02020001320TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM003232
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	10.1	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: MT
MT

DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	10.	PPM	10.1	PPM	1.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1400 PSIG
Expiration Date: 18Apr2018

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

500 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-004
Item No.: 02020001330TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM011385
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	100.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully BLM

DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	100.	PPM	100.	PPM	.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1400 PSIG
Expiration Date: 18Apr2018

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

300 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-005
Item No.: 02020001340TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM002810
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	1,000.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully
BLM

DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	1,000.	PPM	1,000.	PPM	.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1300 PSIG
Expiration Date: 18Apr2018

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

00 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-006
Item No.: 02020001340TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM005787
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	10,080.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully
BLM

DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	10,000.	PPM	10,080.	PPM	.8	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 800 PSIG
Expiration Date: 18Apr2018

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFICATE OF ANALYSIS

Customer Name:	ECSi, Inc.	**Cylinder Number:**	SA25925
Stock or Analyzer Tag Number:	N/A	**Product Class:**	Certified Standard
Customer Reference:	Verbal- Dan	**Cylinder - Contents[1]:**	28 CF @ 2000 PSI
MESA Reference:	104448	**Cylinder-CGA:**	A006-HP-BR/350
Date of Certification:	4/20/2016	**Analysis Method:**	GC-TCD/FID
Recommended Shelf Life:	2 Years	**Preparation Method:**	Gravimetric

Component	Requested Concentration[2]	Reported Concentration[2,3]
Ethylene Oxide	50 ppm	48.8 ppm
Nitrogen	Balance	Balance

Authorized Signature:

1. The fill pressure shown on the COA is as originally quoted. The fill pressure measured by the customer may differ from the fill pressure originally quoted due to temperature effects, compressibility of the individual components when blended together in the cylinder, gauge accuracy or reduction in content volume before shipping as a result of samples withdrawn for laboratory QC necessary to ensure product quality.
2. Unless otherwise stated, concentrations are given in molar units.
3. Vapor pressure mixes are blended at a sufficiently low pressure so as to eliminate phase separation under most low temperature conditions encountered during transport or storage. However, it is generally recommended that cylinders containing vapor pressure restricted mixes be placed on the floor in a horizontal position and rolled back and forth to improve homogeneity of the gas phase mixture before being put into service.

Analytical Gas Standards are prepared and analyzed using combinations of NIST traceable weights, SRM's provided by NIST, or internal gas standards that have been verified for accuracy using procedures published by the US-EPA. Pure gases are analyzed and certified for purity using minor component Analytical Gas Standards prepared according to the methods specified above. Balances are calibrated to NIST test weights covered by NIST test number 822/256175/96. Reference Certification #'s: 163/W, 830/N and 3280. Calibration methods are in conformance with MIL-STD 45662A.

MESA Specialty Gases & Equipment
division of MESA International Technologies, Inc.
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TEL: 714-434-7102 • FAX: 714-434-8006 • E-mail: mail@mesagas.com
On-line Catalog at www.mesagas.com

APPENDIX G

Process/Parametric Monitoring Data

)I ANTARES KORSCP V3Q-4 12/12/16 Mon 18:34 CYCLE 751 CHECK VALUE 22130
RUN NUMBER 1860427

TIME	PRESS INHGA	TEMP (DEG F) AVG	RH %	VAP GAS	ETO MG/L	H2O MG/L	ALARMS & MESSAGES	ACTION TAKEN
8:34	14.4	126		120	672	16.6		
MAX:	14.4	126		120	672	16.6	PHASE 0:12	PHASE ELAPSED 0:12
MIN:	2.0	125		76	0	2.2		CYCLE 2:20

STERILANT USED THIS PHASE: 59.6, CYCLE TOTAL: 59.6

GAS DWELL (ED) PHASE

8:35	14.4	126		120	686	16.9		
8:35	14.4	126		120	690	17.1		OPERATOR CYCLE STOP
8:35	OPERATOR SENSOR CHECK --			PR	48.8,	RH	117, JWT 130, VLT 82, VGX 120	
	CT1	127,	CT2	124,	CT3	126,	P01 124, P02 82, P03 82, P04 82	
	P05	82,	P06	82,	P07	82,	P08 82, P09 82, P10 82, P11 82	
	P12	82,	P13	82,	P14	82,	P15 82, P16 82, P17 82, P18 82	
	P19	82,	P20	82,	ETO	704,	H2O 17.2, WT 295.1	
8:35	"RC 12DEC2016							
8:36	14.4	126		119	706	17.2		
8:37	14.4	126		118	709	17.2		
8:38	14.4	126		117	711	17.2		
8:39	14.4	126		116	711	17.7		
8:40	14.4	126		116	711	17.5		
8:41	14.4	126		115	712	17.7		
8:42	14.4	126		115	712	17.7		
8:43	14.4	126		114	711	17.7		
8:44	14.4	126		114	711	17.7		
8:45	14.4	125		114	711	18.0		
8:46	14.4	125		113	711	18.1		
8:47	14.4	125		113	711	18.1		
8:48	14.4	125		113	711	18.1		
8:49	14.4	125		112	711	18.3		
8:50	14.4	125		112	711	18.6		
8:50	14.4	125		112	711	18.6	CYCLE STILL STOPPED	
8:51	14.4	125		112	711	18.6		
8:52	14.4	125		112	711	19.1		
8:53	14.4	125		112	711	19.1		
8:54	14.4	125		111	711	19.1		
8:55	14.4	125		111	711	19.1		
8:56	14.4	125		111	711	19.1		
8:57	14.4	125		111	711	19.5		
8:58	14.4	125		111	711	19.7		
8:59	14.4	125		111	711	19.5		
9:00	14.4	125		110	711	19.9		
9:01	14.4	125		110	711	19.9		
9:02	14.4	125		110	711	19.9		
9:03	14.4	125		110	711	19.9		
9:04	14.4	125		110	711	19.9		
9:05	14.4	125		110	711	19.9		
9:05	14.4	125		110	712	19.9	CYCLE STILL STOPPED	
9:06	14.4	125		110	712	20.1		
9:07	14.4	125		110	713	20.4		

)I ANTARES KORSCP V3Q-4 12/12/16 Mon 20:27 CYCLE 751 CHECK VALUE 22130
RUN NUMBER 1860427

TIME	PRESS INHGA	TEMP (DEG F) AVG	RH %	VAP GAS	ETO MG/L	H2O MG/L	ALARMS & MESSAGES	ACTION TAKEN
0:27	14.6	125		107	713	25.9		
0:28	14.6	125		107	713	25.9		
0:29	14.6	125		107	713	25.9		
0:30	14.6	125		107	713	25.9		
0:31	14.6	125		107	713	25.9		
0:32	14.6	125		107	713	25.9		
0:33	14.6	125		107	713	25.9		
0:33	14.6	125		107	713	26.0		OPERATOR CYCLE ABORT
0:33	14.6	125		107	713	26.0	SHORT EXPOSURE	
0:33	14.6	125		107	713	26.0		
MAX:	14.6	126		120	716	26.0	PHASE 0:00	PHASE ELAPSED 1:58
MIN:	14.4	125		107	686	16.9		CYCLE 4:18

AFTER VACUUM PHASE

0:33	14.6	125		107	713	26.2		
0:34	13.6	125		94	699	25.9		
0:35	12.5	125		94	638	24.4		
0:35	12.4	125		94	638	24.4	SLOW EVACUATION	
0:35	OPERATOR SENSOR CHECK --			PR	41.6,	RH	121, JWT 130, VLT 81, VGX 95	
	CT1	126, CT2	123,	CT3	125,	P01	124, P02 81, P03 81, P04 81	
	P05	81, P06	81,	P07	81,	P08	81, P09 81, P10 81, P11 81	
	P12	81, P13	81,	P14	81,	P15	81, P16 81, P17 81, P18 81	
	P19	81, P20	81,	ETO	627,	H2O	24.1, WT 295.2	
0:36	11.5	125		95	589	23.5		
0:37	10.5	125		96	541	22.3		
0:38	9.7	125		96	498	20.7		
0:39	9.0	125		97	458	19.8		
0:40	8.3	125		97	422	18.8		
0:41	7.6	125		98	389	17.7		
0:42	7.1	125		98	358	16.8		
0:43	6.5	125		99	331	15.9		
0:44	6.0	125		100	307	15.0		
0:45	5.6	125		100	283	14.3		
0:46	5.1	125		100	262	13.1		
0:47	4.8	125		101	244	12.7		
0:48	4.4	125		101	226	11.8		
0:49	4.1	125		102	210	11.6		
0:50	3.8	125		102	195	10.9		
0:51	3.5	125		102	179	10.4		
0:52	3.2	125		103	166	9.6		
0:53	3.0	125		103	156	9.3	EVACUATION PRESSURE	
0:53	3.0	125		103	156	9.3		
MAX:	14.6	125		107	713	26.2	PHASE 0:19	PHASE ELAPSED 0:19
MIN:	3.0	125		94	156	9.3		CYCLE 4:38

STERIGENICS
7775 S QUINCY STREET
WILLOWBROOK, IL 60527
1-630-654-5151
CHAMBER NO. 8

Jc 12DEC16

DATE 12/12/16 Mon
PROG VERSION KORSCP V3Q-4
IN NUMBER 1852745

CYCLE 751

12DEC16

STERILANT EO
CHECK VALUE 22130
OPERATOR R CASTELLANO

ISTOMER MAINTENANCE
IT NO. ENG #2 30NOV2016
IANTITY NA
!ODUCT NA

IRRENT TANK: LOT # E002374UTLX902993L16, TARE 283.0 LB
:ALE WEIGHT 433.4 LB, STERILANT LEFT 145.4 LB

P R O C E S S P A R A M E T E R S

CHAMBER TEMP 125 F, COOL AT 135 F, BLOWER IS USED, ALARM REPETITION 15:00 MM:SS
VACUUM A 2.0 INHGA, 2.01 INHG/MIN, REQD 3.0 INHGA
LEAK TEST 0:05 HH:MM, TOLERANCE 0.2 INHG
NITROGEN DILUTION 2 CYCLES; NITROGEN: 24.0 INHGA, 1.51 INHG/MIN
EVAC: 2.0 INHGA, 2.01 INHG/MIN
GAS A 1 CYCLES; INJ: 14.4 INHGA, 1.00 INHG/MIN, EO
GAS DWELL 14.4 INHGA, -0.2 INHG, DWELL 1:00 HH:MM
AFTER VACUUM 3.0 INHGA OR 0:45 HH:MM, 2.01 INHG/MIN, REQD 3.5 INHGA
GAS WASH A 3 CYCLES RLS: 23.0 INHGA, 1.51 INHG/MIN, NITR
VAC: 3.0 INHGA OR 0:45 HH:MM, 2.01 INHG/MIN
REQD 3.5 INHGA
GAS WASH B 1 CYCLES RLS: 23.0 INHGA, 1.51 INHG/MIN, AIR
VAC: 3.0 INHGA OR 0:45 HH:MM, 2.01 INHG/MIN
REQD 3.5 INHGA
RELEASE 28.0 INHGA, 1.51 INHG/MIN

TIME	PRESS INHGA	TEMP (DEG F) AVG	RH %	VAP ETO GAS MG/L	H2O MG/L	ALARMS & MESSAGES	ACTION TAKEN
7:13	OPERATOR SENSOR CHECK -- PR 100.1, RH 0, JWT 128, VLT 85, VGX 108						
	CT1 125, CT2 127, CT3 124, P01 127, P02 85, P03 85, P04 85						
	P05 85, P06 85, P07 85, P08 85, P09 85, P10 85, P11 85						
	P12 85, P13 85, P14 85, P15 85, P16 85, P17 85, P18 85						
	P19 85, P20 85, ETO 0, H2O 7.0, WT 433.3						
	VACUUM A PHASE						
7:15	29.4	125		107	0	5.7	
7:15	OPERATOR SENSOR CHECK -- PR 99.4, RH 0, JWT 127, VLT 85, VGX 107						
	CT1 124, CT2 127, CT3 123, P01 127, P02 85, P03 85, P04 85						
	P05 85, P06 85, P07 85, P08 85, P09 85, P10 85, P11 85						
	P12 85, P13 85, P14 85, P15 85, P16 85, P17 85, P18 85						
	P19 85, P20 85, ETO 0, H2O 5.6, WT 433.4						
7:16	27.3	125		107	0	5.4	
7:17	25.3	125		107	0	5.1	
7:18	23.2	124		107	0	4.7	
7:19	21.2	124		107	0	4.2	

)I ANTARES KORSCP V3Q-4 12/12/16 Mon 19:02 CYCLE 751 CHECK VALUE 22130
JN NUMBER 1852745

TIME	PRESS INHGA	TEMP (DEG F) AVG	RH %	VAP GAS	ETO MG/L	H2O MG/L	ALARMS & MESSAGES	ACTION TAKEN
19:02	3.2	129		89	3	0.1		
19:03	4.2	129		75	69	0.1		
19:04	5.2	129		80	140	2.1		
19:05	6.2	129		90	206	3.3		
19:06	7.2	129		99	260	4.2		
19:07	OPERATOR SENSOR CHECK --			PR	27.1,	RH	0, JWT 139, VLT 85, VGX 96	
	CT1 129, CT2 130, CT3 129, P01 130, P02 85, P03 85, P04 85							
	P05 85, P06 85, P07 85, P08 85, P09 85, P10 85, P11 85							
	P12 85, P13 85, P14 85, P15 85, P16 85, P17 85, P18 85							
	P19 85, P20 85, ETO 294, H2O 4.8, WT 401.9							
19:07	8.2	129		104	320	5.3		
19:08	9.2	129		110	381	6.6		
19:09	10.2	129		113	440	7.6		
19:10	11.2	129		116	495	8.3		
19:11	12.2	129		117	557	9.2		
19:12	13.2	129		118	618	10.1		
19:13	14.2	129		118	673	10.6		
19:13	14.4	129		118	698	10.7		
MAX:	14.4	129		118	698	10.7	PHASE 0:12	PHASE ELAPSED 0:12
MIN:	2.0	128		75	0	0.1		CYCLE 1:58

STERILANT USED THIS PHASE: 64.2, CYCLE TOTAL: 64.2

GAS DWELL (EO) PHASE

19:13	14.5	129		118	706	10.9		
19:14	14.5	129		117	727	11.1		
19:15	14.5	129		117	729	11.1		OPERATOR CYCLE STOP
19:15	OPERATOR SENSOR CHECK --			PR	49.0,	RH	0, JWT 137, VLT 85, VGX 117	
	CT1 128, CT2 130, CT3 129, P01 130, P02 85, P03 85, P04 85							
	P05 85, P06 85, P07 85, P08 85, P09 85, P10 85, P11 85							
	P12 85, P13 85, P14 85, P15 85, P16 85, P17 85, P18 85							
	P19 85, P20 85, ETO 729, H2O 11.1, WT 369.0							
19:15	"RC 12DEC2016							
19:15	14.5	129		117	729	11.5		
19:16	14.5	129		116	732	11.5		
19:17	14.4	129		116	734	11.5		
19:18	14.4	129		115	734	11.5		
19:19	14.4	129		115	734	11.5		
19:20	14.4	129		114	734	11.5		
19:21	14.4	129		114	734	11.3		
19:22	14.4	129		113	734	11.5		
19:23	14.4	129		113	734	11.5		
19:24	14.4	129		113	734	11.5		
19:25	14.4	129		112	734	11.5		
19:26	14.4	128		112	734	11.5		
19:27	14.4	128		112	734	11.5		
19:28	14.4	128		111	734	11.5		
19:29	14.4	128		111	734	11.5		
19:30	14.4	128		111	734	11.5	CYCLE STILL STOPPED	

)I ANTARES KORSCP V3Q-4 12/12/16 Mon 20:49 CYCLE 751 CHECK VALUE 22130
JN NUMBER 1852745

TIME	PRESS INHGA	TEMP (DEG F) AVG	RH %	VAP GAS	ETO MG/L	H2O MG/L	ALARMS & MESSAGES	ACTION TAKEN
20:49	14.4	125		104	729	12.0		
20:50	14.4	125		104	729	12.0		
20:51	14.4	125		104	731	12.4		
20:52	14.4	125		104	729	12.4		
20:53	14.4	125		104	731	12.0		
20:54	14.4	125		104	732	12.0		
20:55	14.4	125		104	732	12.1		
20:56	14.4	125		104	732	12.3		
20:57	14.4	125		104	732	12.4		
20:58	14.4	125		104	732	12.4		
20:59	14.4	125		104	732	12.0		
21:00	14.4	125		104	732	12.0	CYCLE STILL STOPPED	
21:00	14.4	125		104	732	12.3		
21:01	14.4	125		104	732	12.3		OPERATOR CYCLE ABORT
21:01	14.4	125		104	732	12.3	SHORT EXPOSURE	
21:01	14.4	125		104	732	12.3		
MAX:	14.5	129		118	734	12.4	PHASE 0:01	PHASE ELAPSED 1:47
MIN:	14.4	125		104	706	10.9		CYCLE 3:46

AFTER VACUUM PHASE

21:01	14.4	125		104	732	12.3		
21:02	13.2	125		98	713	12.0		
21:03	12.0	125		98	643	10.8		
21:03	11.8	125		98	637	10.6	SLOW EVACUATION	
21:04	10.8	125		98	584	10.3		
21:05	9.8	125		98	528	9.7		
21:06	8.9	125		98	484	9.2		
21:07	8.1	125		98	439	8.3		
21:08	7.4	125		98	399	7.9		
21:09	6.7	125		98	362	6.8		
21:10	6.1	125		98	328	6.0		
21:11	5.5	125		98	300	5.6		
21:12	5.0	125		98	273	5.4		
21:13	4.5	125		99	250	4.2		
21:14	4.1	125		99	229	4.2		
21:15	3.8	125		99	210	3.8		
21:16	3.5	125		99	193	3.5		
21:17	3.2	125		100	176	3.2		
21:18	3.0	125		100	167	3.2	EVACUATION PRESSURE	
21:18	3.0	125		100	167	3.2		
MAX:	14.4	125		104	732	12.3	PHASE 0:16	PHASE ELAPSED 0:16
MIN:	3.0	125		98	167	3.2		CYCLE 4:02

GAS WASH A PHASE

21:18	3.0	125		100	167	3.2	========= RELEASE 1 ==========	
21:19	4.6	125		90	195	3.3		

STERIGENICS
7775 QUINCY STREET
WILLOWBROOK, IL 60527
1-630-654-5151
CHAMBER NO. 3

JO 12 DEC16

X 12DEC16

DATE 12/12/16 Mon
PROG VERSION KORSCP V30-4
RUN NUMBER 1860454

CYCLE 751

STERILANT EO
CHECK VALUE 22130
OPERATOR R CASTELLANO

CUSTOMER MAINTENANCE
LOT NO. ENG #7-12DEC2017
QUANTITY NA
PRODUCT NA

RRENT TANK: LOT # E002916UTLX902993L16, TARE 278.0 LB
ALE WEIGHT 525.2 LB, STERILANT LEFT 242.2 LB

PROCESS PARAMETERS

CHAMBER TEMP 125 F, COOL AT 135 F, BLOWER IS USED, ALARM REPETITION 15:00 MM:SS
VACUUM A 2.0 INHGA, 2.01 INHG/MIN, REQD 3.0 INHGA
LEAK TEST 0:05 HH:MM, TOLERANCE 0.2 INHG
NITROGEN DILUTION 2 CYCLES; NITROGEN: 24.0 INHGA, 1.51 INHG/MIN
EVAC: 2.0 INHGA, 2.01 INHG/MIN
GAS A 1 CYCLES; INJ: 14.4 INHGA, 1.00 INHG/MIN, EO
GAS DWELL 14.4 INHGA, -0.2 INHG, DWELL 1:00 HH:MM
AFTER VACUUM 3.0 INHGA OR 0:45 HH:MM, 2.01 INHG/MIN, REQD 3.5 INHGA
GAS WASH A 3 CYCLES RLS: 23.0 INHGA, 1.51 INHG/MIN, NITR
VAC: 3.0 INHGA OR 0:45 HH:MM, 2.01 INHG/MIN
REQD 3.5 INHGA
GAS WASH B 1 CYCLES RLS: 23.0 INHGA, 1.51 INHG/MIN, AIR
VAC: 3.0 INHGA OR 0:45 HH:MM, 2.01 INHG/MIN
REQD 3.5 INHGA
RELEASE 28.0 INHGA, 1.51 INHG/MIN

TIME	PRESS INHGA	TEMP (DEG F) AVG	RH %	VAP GAS	ALARMS & MESSAGES	ACTION TAKEN
9:04	OPERATOR SENSOR CHECK --			PR 99.6,	RH 0, JWT 128,	VLT 80, VGX 116
	CT1 125,	CT2 128,		CT3 125,	P01 128, P02 80,	P03 80, P04 80
	P05 80,	P06 80,		P07 80,	P08 80, P09 80,	P10 80, P11 80
	P12 80,	P13 80,		P14 80,	P15 80, P16 80,	P17 80, P18 80
	P19 80,	P20 80,		ETO 0,	H2O 0.1, WT 525.2	
				VACUUM A PHASE		
9:05	29.4	126		116		
9:05	OPERATOR SENSOR CHECK --			PR 99.5,	RH 0, JWT 132,	VLT 80, VGX 116
	CT1 125,	CT2 128,		CT3 125,	P01 127, P02 80,	P03 80, P04 80
	P05 80,	P06 80,		P07 80,	P08 80, P09 80,	P10 80, P11 80
	P12 80,	P13 80,		P14 80,	P15 80, P16 80,	P17 80, P18 80
	P19 80,	P20 80,		ETO 0,	H2O 0.1, WT 525.2	
9:06	27.3	126		116		
9:07	25.4	126		115		
9:08	23.4	126		114		
9:09	21.4	125		114		

I ANTARES KORSOP V3Q-4 12/12/16 Mon 20:39 CYCLE 751 CHECK VALUE 22130
RUN NUMBER 1660454

TIME	PRESS INHGA	TEMP (DEG F) AVG	RH %	VAP GAS	ALARMS & MESSAGES	ACTION TAKEN
0:39	OPERATOR SENSOR CHECK --			PR 24.0,	RH 0, JWT 132, VLT 79, VGX 51	
	CT1 123,	CT2 129,	CT3	123,	P01 129, P02 79, P03 79, P04 79	
	P05 79,	P06 79,	P07	79,	P08 79, P09 79, P10 79, P11 79	
	P12 79,	P13 79,	P14	79,	P15 79, P16 79, P17 79, P18 79	
	P19 79,	P20 79,	ETO	0,	H2O 0.1, WT 512.6	
0:40	7.1	125		51		
0:40	OPERATOR SENSOR CHECK --			PR 24.0,	RH 0, JWT 131, VLT 79, VGX 53	
	CT1 123,	CT2 129,	CT3	123,	P01 129, P02 79, P03 79, P04 79	
	P05 79,	P06 79,	P07	79,	P08 79, P09 79, P10 79, P11 79	
	P12 79,	P13 79,	P14	79,	P15 79, P16 79, P17 79, P18 79	
	P19 79,	P20 79,	ETO	0,	H2O 0.1, WT 512.6	
0:41	7.1	125		55		
0:41	OPERATOR SENSOR CHECK --			PR 23.9,	RH 0, JWT 131, VLT 79, VGX 56	
	CT1 123,	CT2 129,	CT3	123,	P01 129, P02 79, P03 79, P04 79	
	P05 79,	P06 79,	P07	79,	P08 79, P09 79, P10 79, P11 79	
	P12 79,	P13 79,	P14	79,	P15 79, P16 79, P17 79, P18 79	
	P19 79,	P20 79,	ETO	0,	H2O 0.1, WT 512.6	
0:42	7.1	125		56		
0:42	OPERATOR SENSOR CHECK --			PR 23.9,	RH 0, JWT 131, VLT 79, VGX 58	
	CT1 123,	CT2 129,	CT3	123,	P01 129, P02 79, P03 79, P04 79	
	P05 79,	P06 79,	P07	79,	P08 79, P09 79, P10 79, P11 79	
	P12 79,	P13 79,	P14	79,	P15 79, P16 79, P17 79, P18 79	
	P19 79,	P20 79,	ETO	0,	H2O 0.1, WT 512.6	
0:43	7.1	125		62		
0:43	OPERATOR SENSOR CHECK --			PR 23.9,	RH 0, JWT 132, VLT 79, VGX 63	
	CT1 123,	CT2 129,	CT3	123,	P01 129, P02 79, P03 79, P04 79	
	P05 79,	P06 79,	P07	79,	P08 79, P09 79, P10 79, P11 79	
	P12 79,	P13 79,	P14	79,	P15 79, P16 79, P17 79, P18 79	
	P19 79,	P20 79,	ETO	0,	H2O 0.1, WT 512.6	
0:43	7.1	125		63		CYCLE CONTINUED
0:44	8.2	125		71		
0:45	9.2	125		72		
0:46	10.2	125		78		
0:47	11.2	125		82		
0:48	12.2	125		87		
0:49	13.2	125		92		
0:50	14.2	125		96		
0:50	14.4	125		98		
MAX:	14.4	125		109	PHASE 0:11	PHASE ELAPSED 0:18
MIN:	2.0	125		50		CYCLE 1:45

STERILANT USED THIS PHASE: 30.1, CYCLE TOTAL: 30.1

GAS DWELL (EO) PHASE

0:50	14.5	125	98	
0:50	14.5	125	99	OPERATOR CYCLE STOP
0:51	14.5	125	99	
0:52	14.4	125	100	
0:53	14.4	125	101	

I ANTARES KORSCP V3Q-4 12/12/16 Mon 21:42 CYCLE 751 CHECK VALUE 22130
RUN NUMBER 1860454

TIME	PRESS INHGA	TEMP (DEG F) AVG	RH %	VAP GAS	ALARMS & MESSAGES	ACTION TAKEN
1:42	14.1	125		112		
MAX:	14.5	126		112	PHASE 0:00	PHASE ELAPSED 0:51
MIN:	14.1	125		98		CYCLE 2:37

AFTER VACUUM PHASE

1:42	14.1	125		112	
1:43	12.2	125		103	
1:44	10.4	125		103	
1:44	10.3	125		103	SLOW EVACUATION
1:45	8.9	125		104	
1:46	7.6	125		105	
1:47	6.5	125		105	
1:48	5.6	125		106	
1:49	4.8	125		106	
1:50	4.3	125		107	
1:51	3.6	125		107	
1:52	3.3	125		107	
1:53	3.0	125		107	EVACUATION PRESSURE
1:53	3.0	125		107	
MAX:	14.1	125		112	PHASE 0:10 PHASE ELAPSED 0:10
MIN:	3.0	125		103	CYCLE 2:47

GAS WASH A PHASE

1:53	3.0	125		107	========== RELEASE 1 ==========
1:54	4.6	125		89	
1:55	6.1	125		85	
1:56	7.6	125		83	
1:57	9.1	125		82	
1:58	10.6	125		83	
1:59	12.1	125		84	
2:00	13.6	125		85	
2:01	15.1	125		85	
2:02	16.6	125		86	
2:03	18.1	125		87	
2:04	19.6	125		87	
2:05	21.1	125		88	
2:06	22.6	125		88	
2:06	23.0	125		89	========== EVACUATION 1 ==========
2:07	20.9	125		90	
2:08	19.0	125		93	
2:08	OPERATOR SENSOR CHECK --		PR	50.3,	RH 0, JWT 129, VLT 79, VGX 94
	CT1 124,	CT2 128,	CT3	123,	P01 126, P02 79, P03 79, P04 79
	P05 79,	P06 79,	P07	79,	P08 79, P09 79, P10 79, P11 79
	P12 79,	P13 79,	P14	79,	P15 79, P16 79, P17 79, P18 79
	P19 79,	P20 79,	ETO	0,	H2O 0.1, WT 494.7
2:09	16.9	125		95	

REPORT OF
AIR POLLUTION SOURCE TESTING
OF AN ETHYLENE OXIDE EMISSION-CONTROL SYSTEM
OPERATED BY STERIGENICS, INC.
IN WILLOWBROOK, ILLINOIS
ON DECEMBER 13, 2016

Submitted to:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 North Grand Avenue East
Springfield, Illinois 62794

Submitted by:

STERIGENICS US, LLC.
2015 Spring Road
Oak Brook, Illinois 60523

I.D. Number 043110AAC

Prepared by:

ECSI, INC.
PO Box 848
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January 20, 2017

ECSi

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TEST DATE

Tuesday, December 13, 2016

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B	Run#1 Chromatograms - Aeration	B-1
C	Run#2 Chromatograms - Aeration	C-1
D	Run#3 Chromatograms - Aeration	D-1
E	Run#1 Chromatograms - Exhaust	E-1
F	Run#2 Chromatograms - Exhaust	F-1
G	Run#3 Chromatograms - Exhaust	G-1
H	Field Data and Calculation Worksheets	H-1
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ED_002192_00004536-00095

1.0 INTRODUCTION

On Tuesday, December 13, 2016, ECSi, Inc. performed air pollution source testing of an ethylene oxide (EtO) emission-control device operated by Sterigenics, Inc. in Willowbrook, Illinois. The control device tested was a two-stage Advanced Air Technologies (AAT) Safe Cell emission-control system, comprised of a packed-tower chemical scrubber (SC1) and a dry-bed reactor (SC2), used to control emissions from two aeration rooms and from four sterilizer vacuum pumps. The purpose of the testing program was to demonstrate continued compliance with the conditions established in the Air Quality Permit granted to Sterigenics by the Illinois Environmental Protection Agency (IEPA).

2.0 EQUIPMENT

The EtO gas-sterilization system is comprised of four commercial sterilizers, which are discharged through liquid-ring vacuum pumps to a two-stage Advanced Air Technologies (AAT) Safe Cell emission-control system. The gas-sterilization and emission-control equipment consist of the following:

- Four Gas Sterilizers, each comprised of a steam-heated sterilization chamber, a recirculating vacuum pump chamber evacuation system, a backvent valve, and a fugitive emissions exhaust hood;

- Two aeration rooms, each comprised of a heated aeration chamber and a chamber exhaust system.

Exhaust and aeration emissions are be controlled by:

- One two-stage Advanced Air Technologies Safe Cell emission-control system, comprised of a packed-tower chemical scrubber (SC1), equipped with a packed reaction/interface column, a scrubber fluid recirculation system, and a scrubber fluid reaction/storage tank, and a dry bed reactor/scrubber (SC2), comprised of a bank of solid-bed reaction vessels, connected in parallel, installed downstream of SC1 and upstream of a dedicated blower exhaust system.

3.0 TESTING

EtO source testing was conducted in accordance with the procedures outlined in USEPA CFR40, Part 63.365. EtO emissions monitoring was conducted simultaneously at the inlet and outlet of the AAT System during the first chamber evacuation of the sterilizer exhaust phase of one of the three sterilizers, and during a one-hour time interval of the aeration process. A total of three exhaust-phase test runs, and three aeration test runs were performed.

Exhaust phase testing with one sterilizer discharging to the scrubber at a time represents worst-case conditions for demonstration of control efficiency compliance. At this lower inlet loading, the scrubber must perform at its maximum efficiency to achieve outlet EtO concentrations low enough to demonstrate compliance.

During the first chamber evacuation of the exhaust phase, EtO emissions to the inlet of the AAT System were determined using the Ideal Gas Law and the chamber conditions at the beginning and at the end of the first chamber evacuation. During the first chamber evacuation of the exhaust phase, EtO emissions from the outlet of the AAT System were determined using direct source sample injection into the GC. During aeration testing, EtO emissions at the inlet and the outlet of the Safe Cell System were determined using direct source sample injection into a GC.

All exhaust phase testing was conducted during normal process load conditions, but with an empty sterilization chamber to facilitate the performance of multiple test runs. All aeration testing was performed during normal process load conditions, after freshly sterilized product had been transferred into an aeration chamber/room. The testing program was conducted in accordance with the procedures outlined in the following sections.

4.0 RULE/COMPLIANCE REQUIREMENTS

The EtO gas-sterilization system at the Willowbrook II facility was tested to demonstrate compliance with EPA requirements, as specified in the IEPA Air Quality Permit. The following requirements must be met:

- The sterilizer exhaust phase (post exposure vacuum pulses) emissions must be vented to control equipment with an EtO emission-reduction efficiency of at least 99 % by weight.

- The emissions from the aeration process must be discharged to control equipment with an EtO emission-reduction efficiency of at least 99.0% by weight or by a maximum concentration of 1 ppmv, whichever is less stringent..

Testing is required to demonstrate compliance with these requirements. Source testing of the AAT Safe Cell System is required initially, and may be required periodically thereafter.

5.0 TEST METHOD REFERENCE

5.1 INTRODUCTION

EtO source testing was performed in accordance with the procedures outlined in USEPA CFR40, Part 63.365. EtO emissions monitoring was conducted simultaneously at the inlet and outlet of the AAT System during the first chamber evacuation of the sterilizer exhaust phase of one of the three sterilizers. A total of three exhaust-phase test runs were performed.

Exhaust phase testing with one sterilizer discharging to the scrubber at a time represents worst-case conditions for demonstration of control efficiency compliance. At this lower inlet loading, the scrubber must perform at its maximum efficiency to achieve outlet EtO concentrations low enough to demonstrate compliance.

During the first chamber evacuation of the exhaust phase, EtO emissions to the inlet of the AAT System were determined using the Ideal Gas Law and the chamber conditions at the beginning and at the end of the first chamber evacuation. During the first chamber evacuation of the exhaust phase, EtO emissions from the outlet of the AAT System were determined using direct source sample injection into the GC. During aeration testing, EtO emissions at the inlet and the outlet of the Safe Cell System were determined using direct source sample injection into a GC.

All exhaust phase testing was conducted during normal process load conditions, but with an empty sterilization chamber to facilitate the performance of multiple test runs. All aeration testing was performed during normal process load conditions, after freshly sterilized product had been transferred into an aeration chamber/room. The testing program was conducted in accordance with the procedures outlined in the following sections.

Operation and documentation of process conditions was performed by personnel from Sterigenics, Inc. using existing monitoring instruments installed by the manufacturer on the equipment to be tested. In accordance with the procedures established in USEPA CFR40, Part 63, Subpart O, scrubber liquor level was recorded.

5.2 VOLUMETRIC FLOW MEASUREMENT

Exhaust gas flow at the outlet of the scrubber was determined by 40 CFR 60, Appendix A, Method 2, using an s-type pitot tube and an inclined-oil manometer. Sampling ports were located in accordance with 40 CFR 60, Appendix A, Method 1. The test ports were located far enough from any flow disturbances to permit accurate flow measurement.

Temperature measurements were obtained from a type K thermocouple and thermometer attached to the sampling probe. Exhaust gas composition was assumed to be air and small amounts of water vapor. Water vapor was negligible and, based on previous test data, a value of 2 percent was used for flow calculations.

5.3 CONTROL EFFICIENCY AND MASS EMISSIONS MEASUREMENT

During the first chamber evacuation of the sterilizer exhaust phase, the mass emissions of EtO vented to the inlet of the scrubber were determined using the procedures outlined in CFR40, Part 63.365. This method allows the determination of the mass of EtO vented to the inlet of the scrubber through calculations based on the Ideal Gas Law and using the conditions (pressure, temperature, volume) of the sterilization chamber immediately after it has been charged with sterilant gas, and upon conclusion of the first chamber evacuation of the exhaust phase.

The mass of EtO vented to the inlet of the scrubber during the first chamber evacuation of the exhaust phase was determined by calculating the mass of EtO present in the chamber after the first chamber evacuation and subtracting it from the mass of EtO present in the chamber after it has been charged with sterilant gas. The mass of EtO present in the chamber was calculated using Equation 1, shown below in Section 5.9.

During the first chamber evacuation of the sterilizer exhaust phase, EtO emissions from the outlet were determined using direct source sample injection into the GC. During the first chamber evacuation of the sterilizer exhaust phase, EtO emissions from the outlet were determined using direct source sample injection into the GC. During aeration, EtO emissions to the inlet and from the outlet were determined using direct source sample injection into the GC. The mass of EtO emitted from the outlet was determined using Equation 2, shown below in Section 5.9. Mass-mass control-efficiency of EtO during the sterilizer exhaust phase and aeration was calculated by comparing the mass of EtO vented to the system inlet to the mass of EtO vented from the system outlet.

During the sterilization chamber exhaust phase and aeration testing, vented gas was analyzed by an SRI, Model 8610, portable gas chromatograph (GC), equipped with the following: dual, heated sample loops and injectors; dual columns; and dual detectors. A flame ionization detector (FID) was used to quantify emissions at the AAT System inlet, and a photoionization detector (PID) was used to quantify low-level EtO emissions at the AAT System outlet.

5.4 SAMPLE TRANSPORT

Source gas was pumped to the GC at approximately 500-1000 cubic centimeters per minute (cc/min) from the sampling ports through two lengths of Teflon® sample line, each with a nominal volume of approximately 75 cubic centimeters (cc) and an outer diameter of 0.25 inch. At the inlet of the Safe Cell System, the sampling port was located in the plenum immediately upstream packed tower scrubber. At the outlet of the Safe Cell System, sampling ports were located in the exhaust stack downstream of the dry bed reactors.

5.5 GC INJECTION

Source-gas samples were then injected into the GC which was equipped with two heated sampling loops, each containing a volume of approximately 2cc and maintained at 100 degrees Celsius (C). Injections occurred at approximately one-minute intervals during the sterilization chamber exhaust phase, and at approximately five-minute intervals during aeration testing. Helium was the carrier gas for both the FID and the PID.

5.6 GC CONDITIONS

The packed columns for the GC were both operated at 90 degrees C. The columns were stainless steel, 6 feet long, 0.125 inch outer diameter, packed with 1 percent SP-1000 on 60/80 mesh Carbopack B.

During the analysis, the FID was operated at 250 degrees C. The support gases for the FID were hydrogen (99.995% pure) and air (99.9999% pure). Any unused sample gas was vented from the GC system back to the inlet of the control device being tested.

5.7 CALIBRATION STANDARDS

The FID was calibrated for mid-range part-per-million-by-volume (ppmv) level analysis using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

The PID was calibrated for low-range ppmv level analyses using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

Each of these calibration standards was in a separate, certified manufacturer's cylinder. Copies of the calibration gas laboratory certificates are attached as Appendix I.

5.8 SAMPLING DURATION

Exhaust phase EtO measurements will be taken for the entire duration of the first chamber evacuation, which will be approximately 15-30 minutes. This will encompass a total sampling duration of approximately 15-30 minutes for each exhaust phase test run.

Since aeration is a 24-hour process at this facility, with constant discharge flow from the aeration chambers to the emission-control system, aeration testing will consist of a total of three 1-hour test runs. Each test run will be performed after freshly sterilized product has been transferred into an aeration room.

5.9 CONTROL-EFFICIENCY/MASS-EMISSIONS CALCULATIONS

The following equation was used to calculate mass of EtO discharged to the inlet of the emission-control system during the first chamber evacuation of the sterilizer exhaust phase:

EQUATION 1:

$W_c = W_{ci} - W_{cf}$

Where:

W_c = Weight of EtO discharged from the sterilization chamber to the emission-control system during the first chamber evacuation, pounds

W_{ci} = (mw)(p)(P)(V)/(R)(T)

(and W_{cf})

Where:

W_{ci} = Weight of EtO present in the sterilization chamber before the first chamber evacuation, pounds

W_{cf} = Weight of EtO present in the sterilization chamber after the first chamber evacuation, pounds

MW = Molecular weight of EtO, 44.05 lb/mol

p = Percent of EtO in chamber

= W_s/W_i

Where:

W_s = Scale-measured weight of EtO charged into sterilization chamber

W_i = Calculated weight of EtO charged into sterilization chamber (@ 100%)

P = Sterilization chamber pressure (after charging/at the end of the 1st evac), psia

V = Sterilization chamber volume, ft^3

R = Gas constant, 10.73 $psia \cdot ft^3/mol \cdot {}^oR$

T = Sterilization chamber temperature (after charging/at the end of the 1st evac), ^oR

Note: Standard conditions are 68°F and 1 atm.

Mass emissions of EtO during exhaust and aeration will be calculated using the following equation:

EQUATION 2:

MassRate = (VolFlow)(MolWt)(ppmv EtO/10^6)/(MolVol)

Where:

MassRate = EtO mass flow rate, pounds per minute

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VolFlow	=	Corrected volumetric flow rate, standard cubic feet per minute at 68 degrees F
MolWt	=	44.05 pounds EtO per pound mole
ppmv EtO	=	EtO concentration, parts per million by volume
10^6	=	Conversion factor, ppmv per "cubic foot per cubic foot"
MolVol	=	385.32 cubic feet per pound mole at one atmosphere and 68 degrees F

Results of the control-efficiency testing are presented in Section 8.0 and in Tables 1 and 2.

6.0 TEST SCENARIO

During exhaust phase testing, each sterilizer was tested during normal process load conditions, but with an empty sterilization chamber to facilitate the performance of multiple test runs. All aeration testing was performed during normal process load conditions, after freshly sterilized product had been transferred into an aeration chamber/room. A total of three exhaust-phase and three aeration test runs were performed to verify the performance of the emission-control device. Testing was conducted with an effort to offer minimal disruption to the Sterigenics production schedule. The testing schedule was as follows:

1) Testing equipment was set up and calibrated.
2) Aeration Test Run #1 was performed with freshly sterilized product transferred into aeration. Sampling was performed at the inlet and outlet of the AAT System.
3) Aeration Test Run #2 was performed with freshly sterilized product transferred into aeration. Sampling was performed at the inlet and outlet of the AAT System.
4) Aeration Test Run #3 was performed with freshly sterilized product transferred into aeration. Sampling was performed at the inlet and outlet of the AAT System.
5) An empty-chamber cycle was started in one of the sterilizers.
6) Exhaust Phase Test Run #1 was conducted. Sampling was performed at outlet of the scrubber during the first chamber evacuation of the test chamber. During the performance of the test, only the sterilizer used for the test was allowed to discharge to the AAT System.
7) An empty-chamber cycle was started in one of the sterilizers.
8) Exhaust Phase Test Run #2 was conducted. Sampling was performed at outlet of the scrubber during the first chamber evacuation of the test chamber. During the performance of the test, only the sterilizer used for the test was allowed to discharge to the AAT System.
9) An empty-chamber cycle was started in one of the sterilizers.
10) Exhaust Phase Test Run #3 was conducted. Sampling was performed at outlet of the scrubber during the first chamber evacuation of the test chamber. During the performance of the test, only the sterilizer used for the test was allowed to discharge to the AAT System.
11) Post calibration check was performed, testing equipment was packed.

7.0 QA/QC

7.1 FIELD TESTING QUALITY ASSURANCE

At the beginning of the test, the sampling system was leak checked at a vacuum of 15 inches of mercury. The sampling system was considered leak free when the flow indicated by the rotameters fell to zero.

At the beginning of the test, a system blank was analyzed to ensure that the sampling system was free of EtO. Ambient air was introduced at the end of the heated sampling line and drawn through the sampling system line to the GC for analysis. The resulting chromatogram also provided a background level for non-EtO components (i.e. ambient air, carbon dioxide, water vapor) which are present in the source gas stream due to the ambient dilution air which is drawn into the emission-control device, and due to the destruction of EtO by the emission-control device which produces carbon dioxide and water vapor. This chromatogram, designated AMB, is included with the calibration data in Appendix A.

7.2 CALIBRATION PROCEDURES

The GC system was calibrated at the beginning and conclusion of each day's testing. Using the Peaksimple II analytical software, a point-to-point calibration curve was constructed for each detector. A gas cylinder of similar composition as the calibration gases, but certified by a separate supplier, was used to verify calibration gas composition and GC performance.

All calibration gases and support gases used were of the highest purity and quality available. A copy of the laboratory certification for each calibration gas is attached as Appendix I.

8.0 TEST RESULTS

The AAT Safe Cell System demonstrated an EtO control efficiency of 99.96 percent for aeration, and 99.94 percent for exhaust. In accordance with EPA requirements, as specified in the IEPA Air Quality Permit, this control equipment must have an EtO control efficiency of 99 percent or more in control of emissions from exhaust and from aeration. The AAT Safe Cell System met this requirement.

The test results are summarized in Table 1 and 2. This table includes results for EtO control efficiency of the emission-control device. Chromatograms and chromatographic supporting data are attached as Appendices A through G. Copies of field data and calculation worksheets are attached as Appendix H.

TABLES

TABLE 1
ETHYLENE OXIDE CONTROL EFFICIENCY - AERATION OF AN AAT SAFE CELL EMISSION CONTROL DEVICE OPERATED BY STERIGENICS, INC. IN WILLOWBROOK, ILLINOIS (PLANT 2) ON DECEMBER 13, 2016

RUN NUMBER	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
1(3)	1000	25.7	0.01	99.9611
1	1005	25.5	0.01	99.9608
1	1010	25.9	0.01	99.9614
1	1015	23.5	0.01	99.9574
1	1020	25.8	0.01	99.9612
1	1025	25.7	0.01	99.9611
1	1030	25.7	0.01	99.9611
1	1035	25.5	0.01	99.9608
1	1040	25.5	0.01	99.9608
1	1045	25.5	0.01	99.9608
1	1050	25.2	0.01	99.9603
1	1055	25.0	0.01	99.9600
2(4)	1100	25.0	0.01	99.9600
2	1105	25.4	0.01	99.9606
2	1110	25.8	0.01	99.9612
2	1115	25.8	0.01	99.9612
2	1120	25.8	0.01	99.9612
2	1125	25.4	0.01	99.9606
2	1130	25.4	0.01	99.9606
2	1135	25.4	0.01	99.9606
2	1140	24.8	0.01	99.9597
2	1145	25.5	0.01	99.9608
2	1150	25.1	0.01	99.9602
2	1155	24.9	0.01	99.9598
3(5)	1534	22.3	0.01	99.9552
3	1539	22.7	0.01	99.9559
3	1544	23.1	0.01	99.9567
3	1549	23.2	0.01	99.9569
3	1554	23.5	0.01	99.9574
3	1559	23.4	0.01	99.9573
3	1604	23.6	0.01	99.9576
3	1609	23.8	0.01	99.9580
3	1614	23.8	0.01	99.9580
3	1619	23.8	0.01	99.9580
3	1624	23.8	0.01	99.9580
3	1629	24.1	0.01	99.9585
TIME-WEIGHTED AVERAGE:		**24.72**	**0.0100**	**99.9595**
		NYDEQ REQUIRED CONTROL EFFICIENCY:		**99%**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
(3) - Aeration Phase Test Run #1 started at 09:57, ended at 10:57.
(4) - Aeration Phase Test Run #2 started at 10:57, ended at 11:57.
(5) - Aeration Phase Test Run #3 started at 15:32, ended at 16:32.

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TABLE 2
ETHYLENE OXIDE CONTROL EFFICIENCY - EXHAUST OF AN AAT SAFE CELL EMISSION CONTROL DEVICE OPERATED BY STERIGENICS, INC. IN WILLOWBROOK, ILLINOIS (PLANT 2) DECEMBER 13, 2016

Run #	Stack Flow (dscfm) (2)	Average Outlet Conc. (ppm) (1)	Outlet EtO Mass Flow (lbs/min) (3)	Minutes/ Cycle	Outlet EtO Mass Emissions (lbs)	Inlet EtO Mass Emissions (lbs)	EtO Control Efficiency (%)
#1	10400	1.547	0.0018416	12	0.000221	49.8	99.96
#2	10400	1.956	0.0023275	11	0.0002560	49.8	99.95
#3	10400	3.536	0.0042081	9	0.0003787	48.9	99.92
						Average EtO Control Efficiency:	**99.94**
						Required EtO Control Efficiency:	**99**

Notes: (1) - PPM = parts per million by volume
(2) - DSCFM = dry standard cubic feet per minute
(3) - LBS/MIN = EtO emissions, pounds per minute

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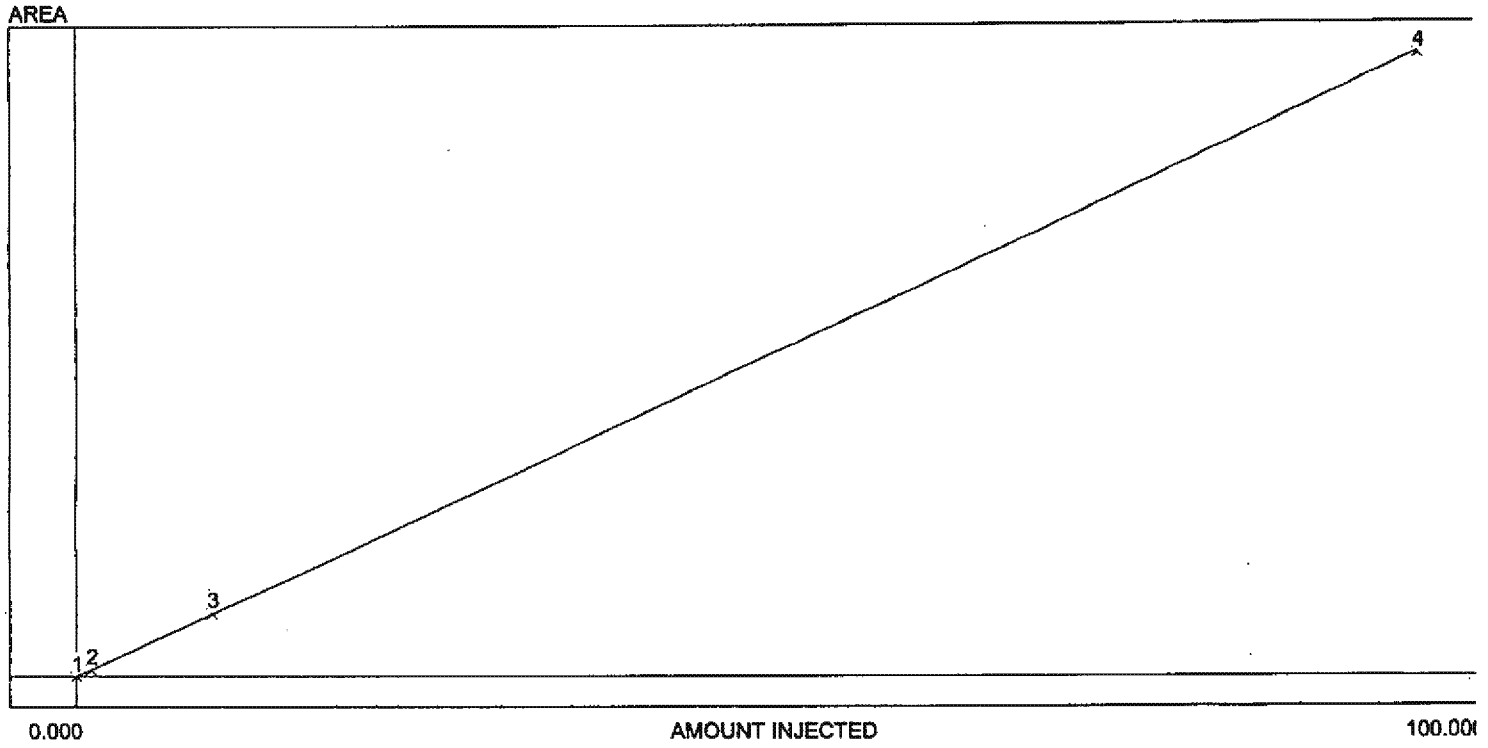
APPENDICES

APPENDIX A

Calibration Data

ak	Name	Start	End	Calibration	Int.Std	Units
	Dead Vol / Air	0.000	0.350		0.000	
	Ambient H2O	0.350	0.500		0.000	
	Ethylene Oxide	0.500	0.600	C:\peak359\1Ster	0.00016	ppm
	Acetaldehyde	0.600	0.800		0.000	
	CO2	0.800	1.000		0.000	

libration file: C:\peak359\1SterWB2016.cal

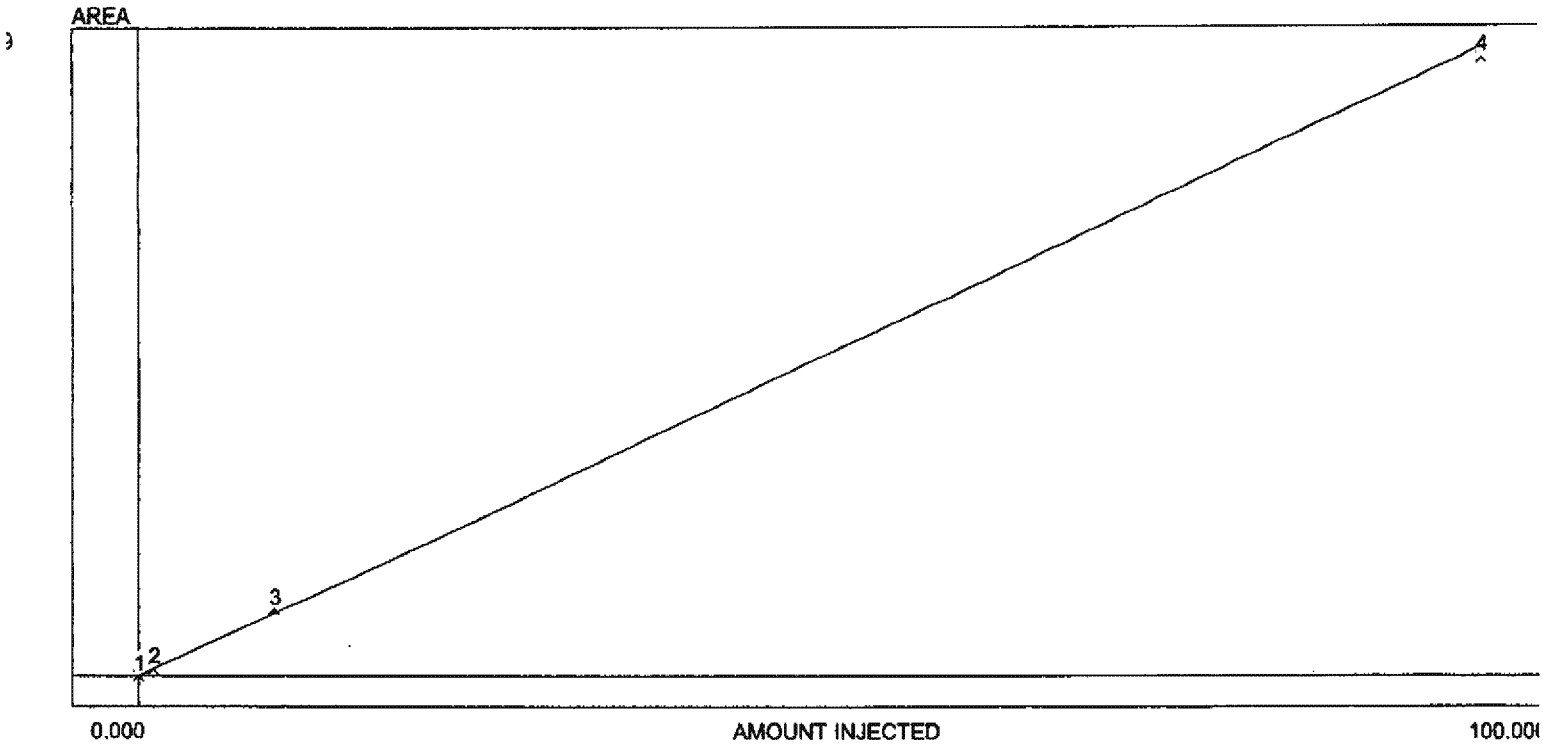


ı slope of curve: 0.43
ıxis intercept: 0.00
earity: 1.00
nber of levels: 4
/rel SD of CF's: 0.2/66.7
).4316X
1.0000
ıt calibrated: Fri Dec 02 08:01:11 2016

.Area/ht.	Amount	CF	Current	Previous #1	Previous #2
0.000	0.000	0.000	0.000	N/A	N/A
0.470	1.100	0.427	0.470	N/A	N/A
4.420	10.100	0.438	4.420	N/A	N/A
43.000	100.000	0.430	43.000	N/A	N/A

ak	Name	Start	End	Calibration	Int.Std	Units
	Dead Vol / Air	0.000	0.350		0.000	
	Ambient H2O	0.350	0.500		0.000	
	Ethylene Oxide	0.500	0.600	C:\peak359\2Ster	0.00016	ppm
	Acetaldehyde	0.600	0.800		0.000	
	CO2	0.800	1.000		0.000	

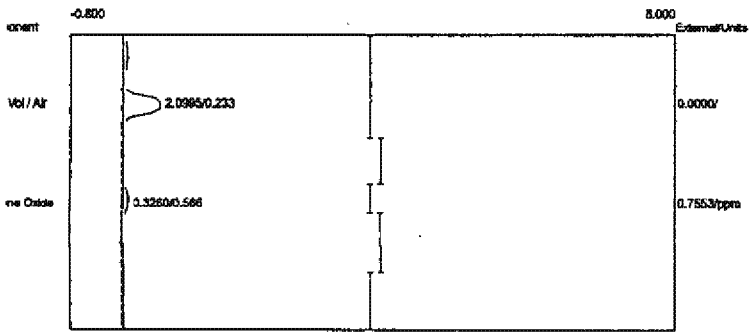
libration file: C:\peak359\2SterWB2016.cal



ɟ slope of curve: 1.82
ıxis intercept: 0.00
earity: 1.00
ɪnber of levels: 4
/rel SD of CF's: 0.9/67.0
1.8223X
0.9999
ɪt calibrated: Fri Dec 02 08:00:23 2016

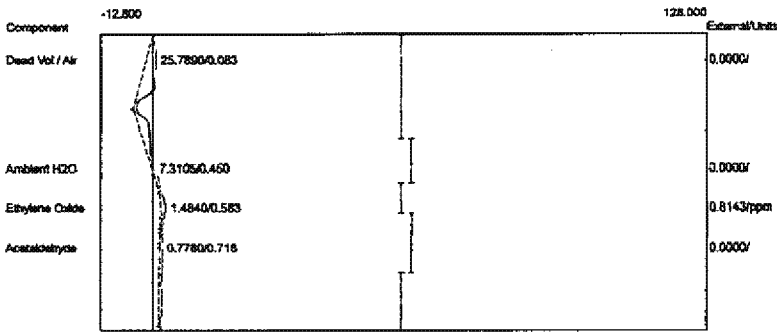
.Area/ht.	Amount	CF	Current	Previous #1	Previous #2
0.000	0.000	0.000	0.000	N/A	N/A
1.910	1.100	1.736	1.910	N/A	N/A
19.600	10.100	1.941	19.600	N/A	N/A
179.000	100.000	1.790	179.000	N/A	N/A

Client: Sterigenics - Willowbrook 2
Client ID: PreCal
ıalysis date: 12/13/2016 11:35:08
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-Amb.CHR (c:\peak359)
Sample: Ambient Background
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.233	2.0995	0.0000	
ylene Oxide	0.566	0.3260	0.7553	ppm
		2.4255	0.7553	

Client: Sterigenics - Willowbrook 2
Client ID: PreCal
Analysis date: 12/13/2016 11:35:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-Amb.CHR (c:\peak359)
Sample: Ambient Background
Operator: D. Kremer

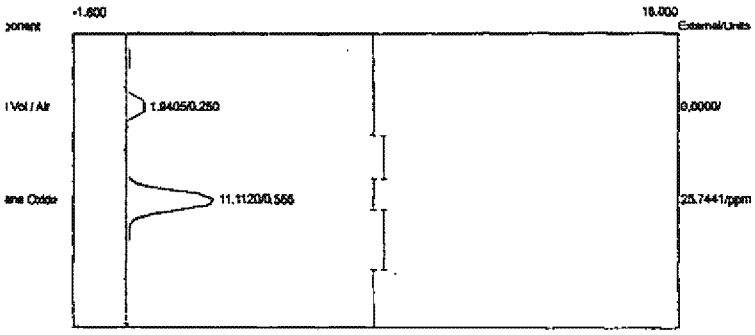


Component	Retention	Area	External	Units
Dead Vol / Air	0.083	25.7890	0.0000	
Ambient H2O	0.450	7.3105	0.0000	
Ethylene Oxide	0.583	1.4840	0.8143	ppm
Acetaldehyde	0.716	0.7780	0.0000	
		35.3615	0.8143	

APPENDIX B

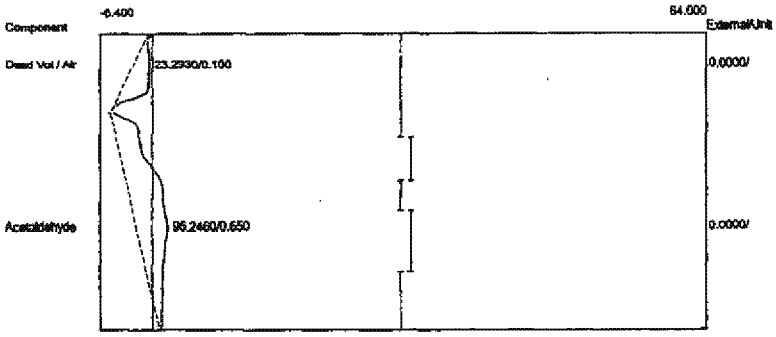
Run#1 Chromatograms - Aeration

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
nalysis date: 12/13/2016 10:00:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A01.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



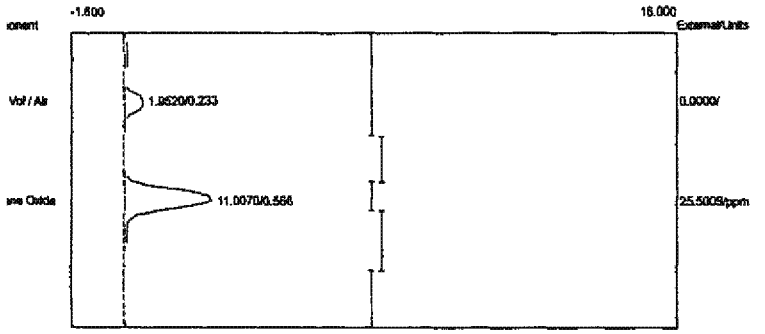
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9405	0.0000	
ıylene Oxide	0.566	11.1120	25.7441	ppm
		13.0525	25.7441	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:00:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A01.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



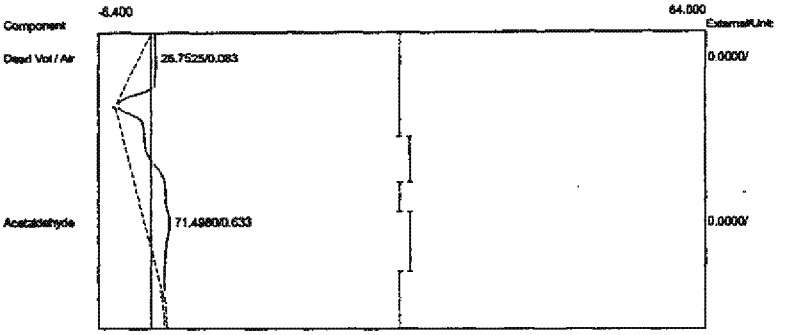
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	23.2930	0.0000	
Acetaldehyde	0.650	96.2460	0.0000	
		119.5390	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
ıalysis date: 12/13/2016 10:05:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A02.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



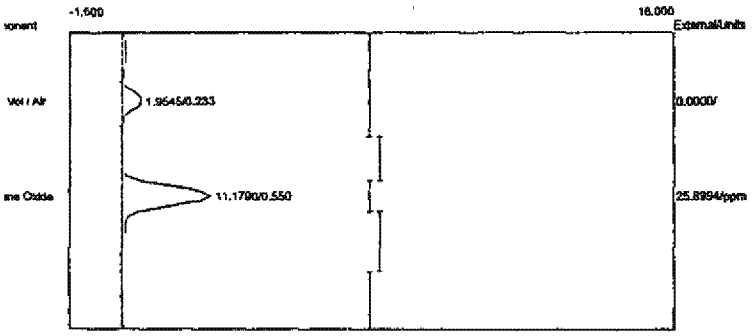
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9520	0.0000	
ıylene Oxide	0.566	11.0070	25.5009	ppm
		12.9590	25.5009	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:05:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A02.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



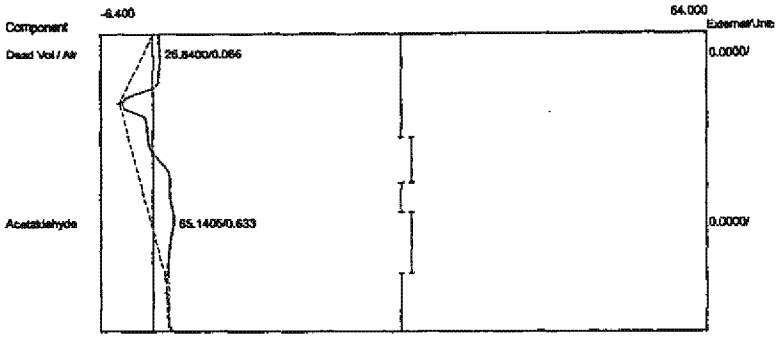
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	26.7525	0.0000	
Acetaldehyde	0.633	71.4980	0.0000	
		98.2505	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
nalysis date: 12/13/2016 10:10:08
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A03.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



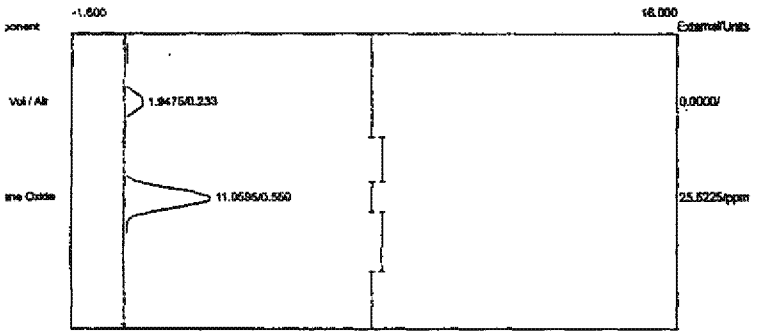
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9545	0.0000	
ylene Oxide	0.550	11.1790	25.8994	ppm
		13.1335	25.8994	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:10:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A03.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



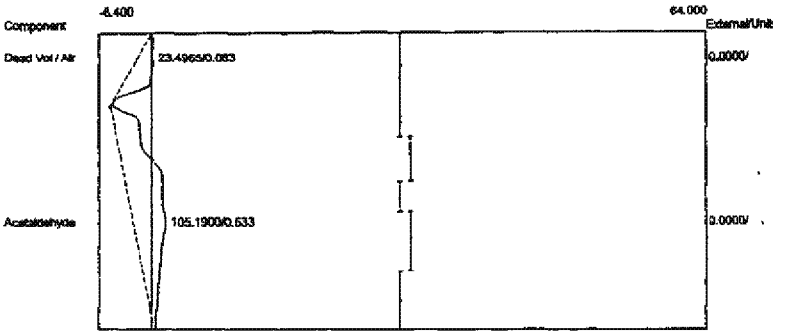
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	26.8400	0.0000	
Acetaldehyde	0.633	65.1405	0.0000	
		91.9805	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
nalysis date: 12/13/2016 10:15:21
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A04.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



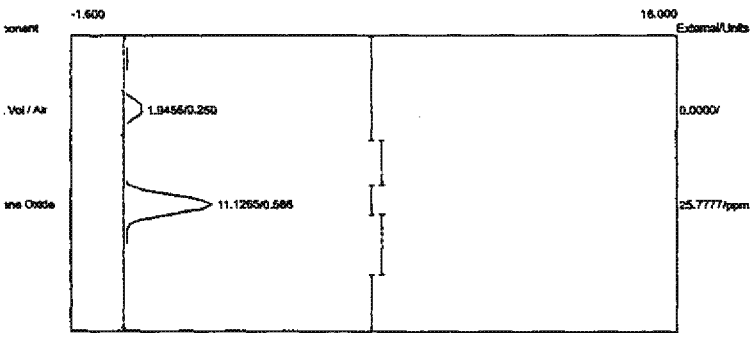
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9475	0.0000	
ylene Oxide	0.550	11.0595	25.6225	ppm
		13.0070	25.6225	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:15:21
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A04.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



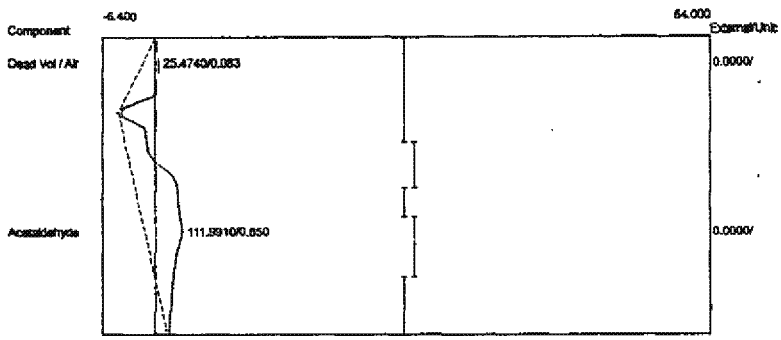
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	23.4965	0.0000	
Acetaldehyde	0.633	105.1900	0.0000	
		128.6865	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
nalysis date: 12/13/2016 10:20:42
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A05.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



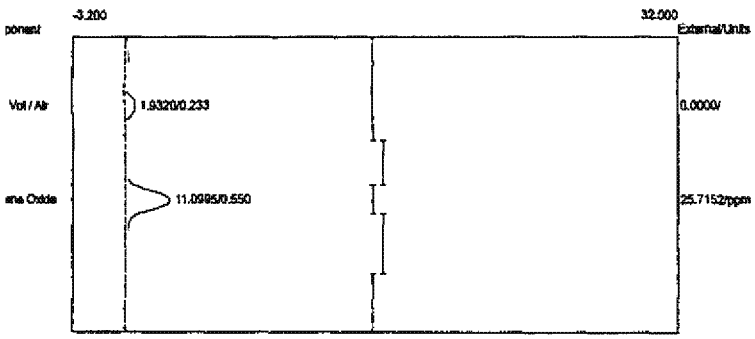
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9455	0.0000	
ylene Oxide	0.566	11.1265	25.7777	ppm
		13.0720	25.7777	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:20:42
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A05.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



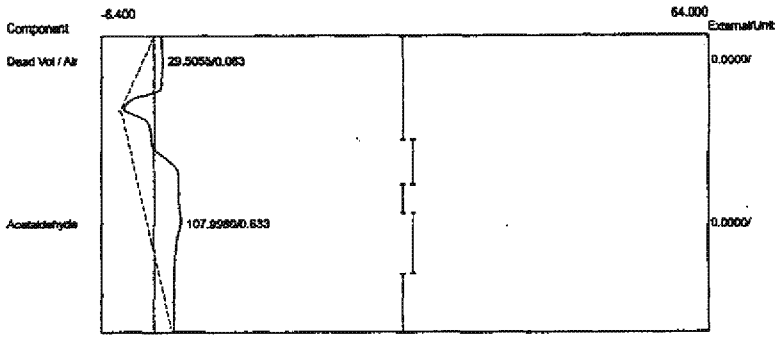
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	25.4740	0.0000	
Acetaldehyde	0.650	111.9910	0.0000	
		137.4650	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
nalysis date: 12/13/2016 10:25:04
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A06.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



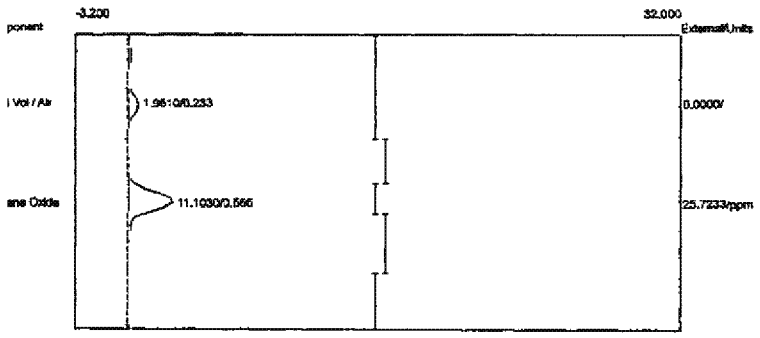
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9320	0.0000	
ylene Oxide	0.550	11.0995	25.7152	ppm
		13.0315	25.7152	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:25:04
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A06.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



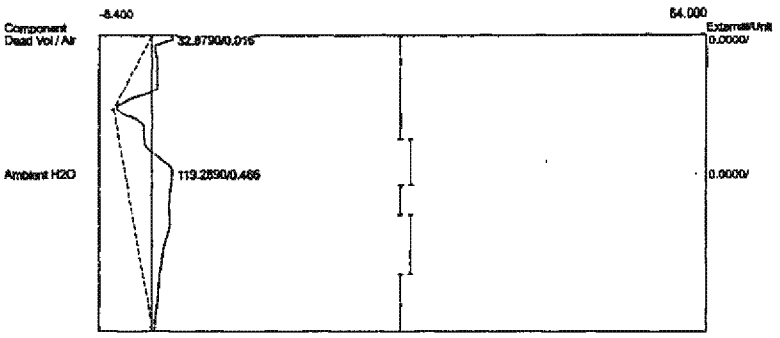
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	29.5055	0.0000	
Acetaldehyde	0.633	107.9980	0.0000	
		137.5035	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
nalysis date: 12/13/2016 10:30:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A07.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



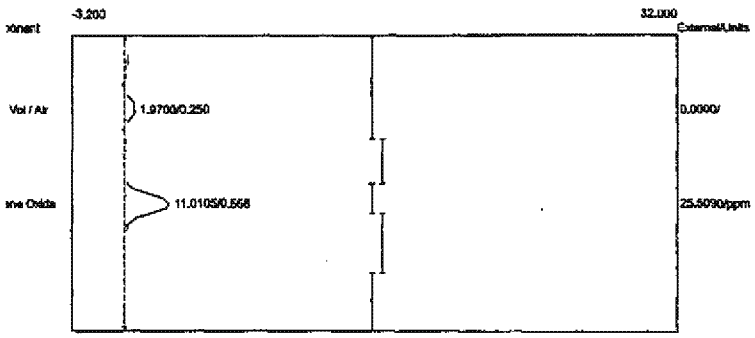
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9610	0.0000	
ıylene Oxide	0.566	11.1030	25.7233	ppm
		13.0640	25.7233	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:30:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A07.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



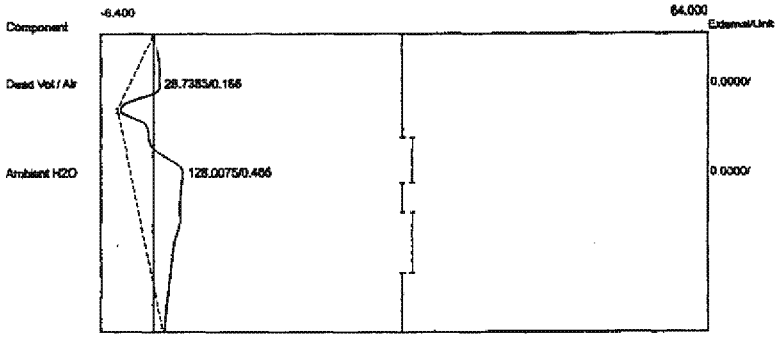
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	32.8790	0.0000	
Ambient H2O	0.466	119.2890	0.0000	
		152.1680	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
nalysis date: 12/13/2016 10:35:17
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
'omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A08.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



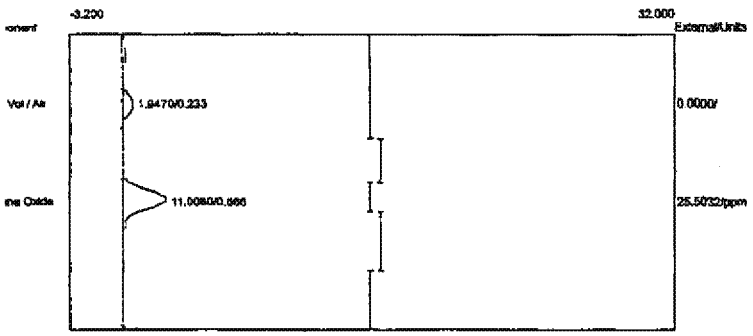
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9700	0.0000	
ylene Oxide	0.566	11.0105	25.5090	ppm
		12.9805	25.5090	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:35:17
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A08.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



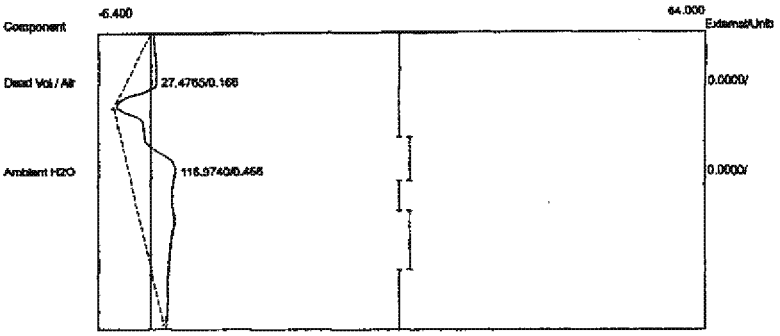
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	28.7385	0.0000	
Ambient H2O	0.466	128.0075	0.0000	
		156.7460	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
ıalysis date: 12/13/2016 10:40:15
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A09.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



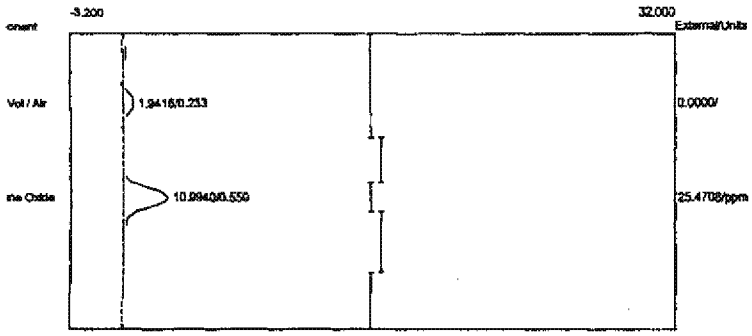
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9470	0.0000	
ıylene Oxide	0.566	11.0080	25.5032	ppm
		12.9550	25.5032	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:40:15
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A09.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



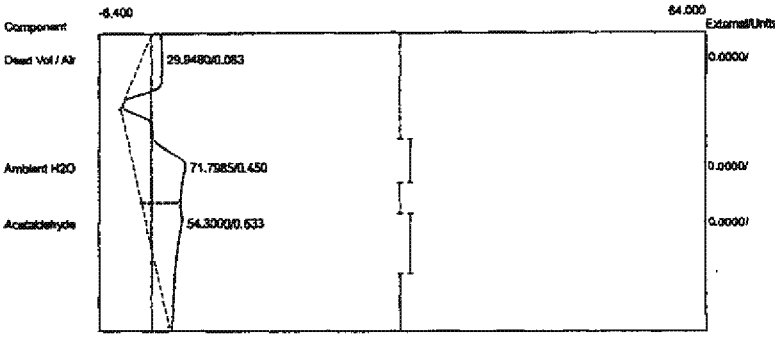
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	27.4765	0.0000	
Ambient H2O	0.466	116.9740	0.0000	
		144.4505	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
ıalysis date: 12/13/2016 10:45:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A10.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



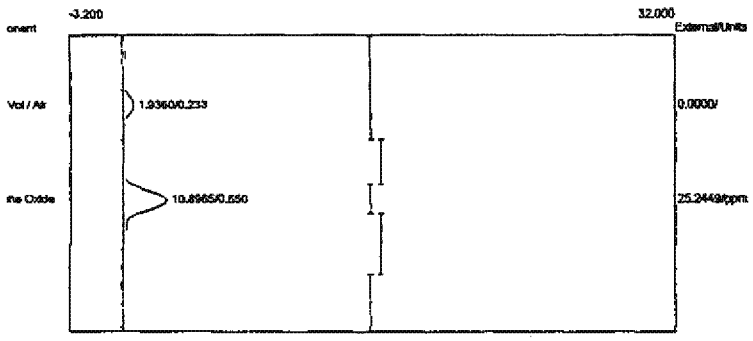
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9415	0.0000	
ıylene Oxide	0.550	10.9940	25.4708	ppm
		12.9355	25.4708	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:45:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A10.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



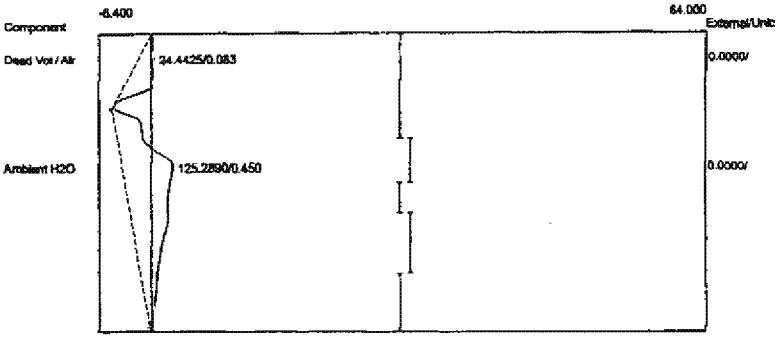
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	29.9480	0.0000	
Ambient H2O	0.450	71.7985	0.0000	
Acetaldehyde	0.633	54.3000	0.0000	
		156.0465	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
ıalysis date: 12/13/2016 10:50:16
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A11.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



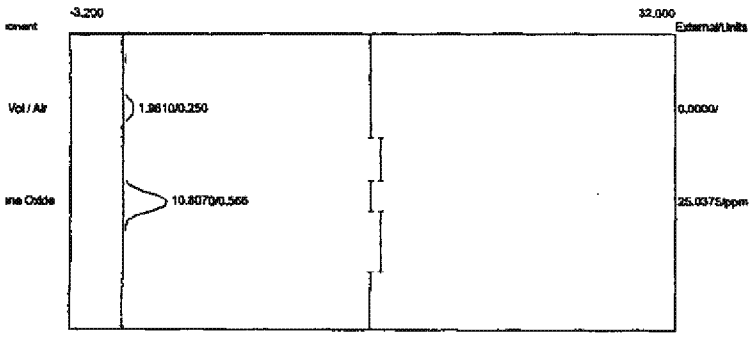
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9360	0.0000	
ıylene Oxide	0.550	10.8965	25.2449	ppm
		12.8325	25.2449	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:50:16
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A11.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



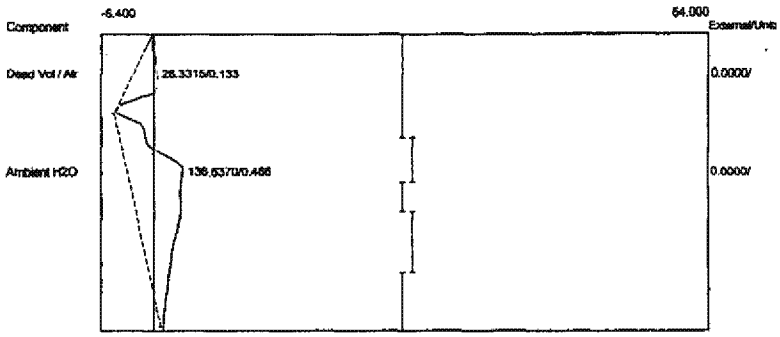
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	24.4425	0.0000	
Ambient H2O	0.450	125.2890	0.0000	
		149.7315	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
ıalysis date: 12/13/2016 10:55:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-1A12.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9610	0.0000	
ıylene Oxide	0.566	10.8070	25.0375	ppm
		12.7680	25.0375	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Aer
Analysis date: 12/13/2016 10:55:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1A12.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer

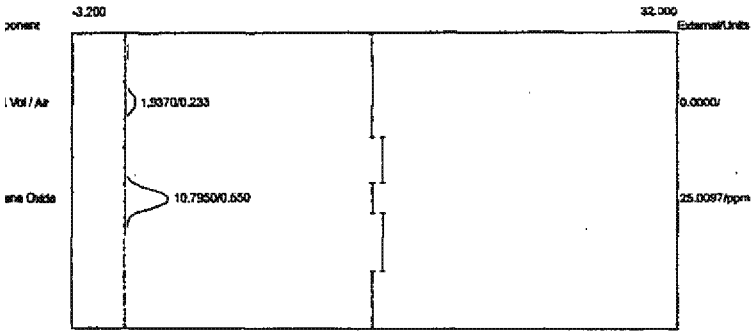


Component	Retention	Area	External	Units
Dead Vol / Air	0.133	26.3315	0.0000	
Ambient H2O	0.466	136.6370	0.0000	
		162.9685	0.0000	

APPENDIX C

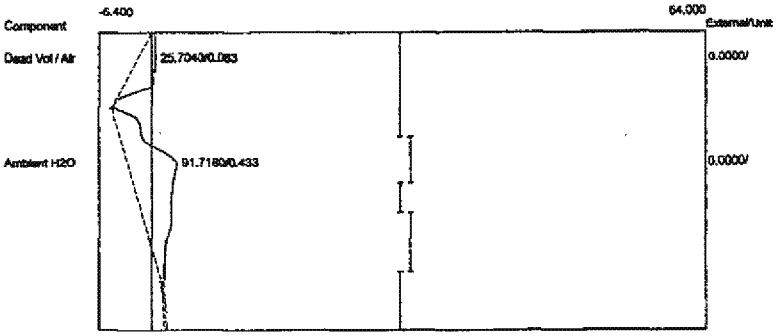
Run#2 Chromatograms - Aeration

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:00:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A01.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



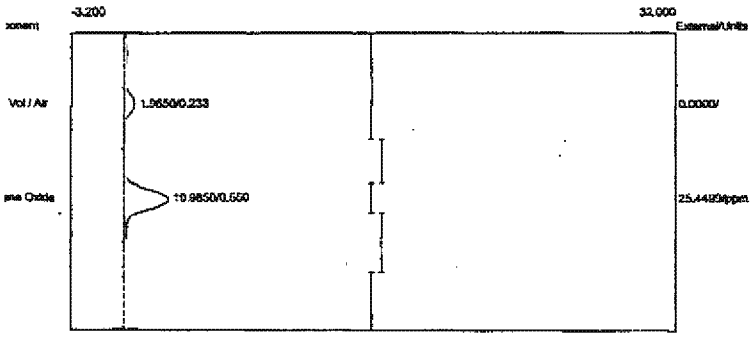
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9370	0.0000	
ylene Oxide	0.550	10.7950	25.0097	ppm
		12.7320	25.0097	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:00:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A01.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



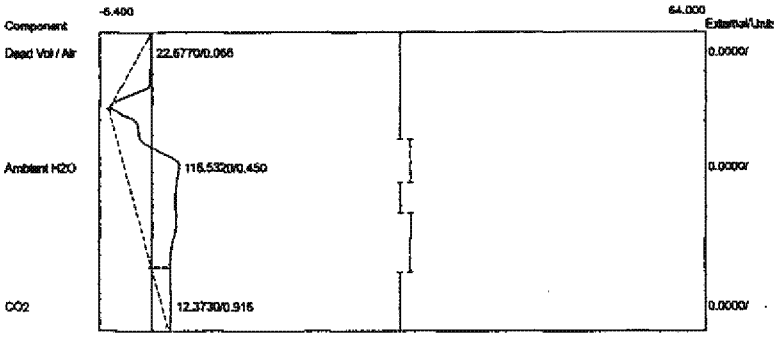
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	25.7040	0.0000	
Ambient H2O	0.433	91.7180	0.0000	
		117.4220	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:05:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A02.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



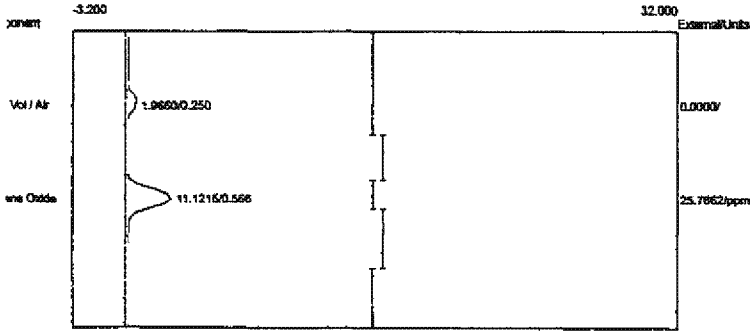
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9650	0.0000	
ylene Oxide	0.550	10.9850	25.4499	ppm
		12.9500	25.4499	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:05:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A02.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



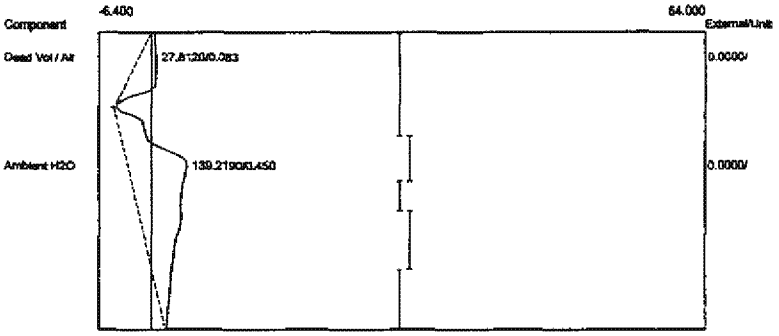
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	22.6770	0.0000	
Ambient H2O	0.450	116.5320	0.0000	
CO2	0.916	12.3730	0.0000	
		151.5820	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:10:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A03.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



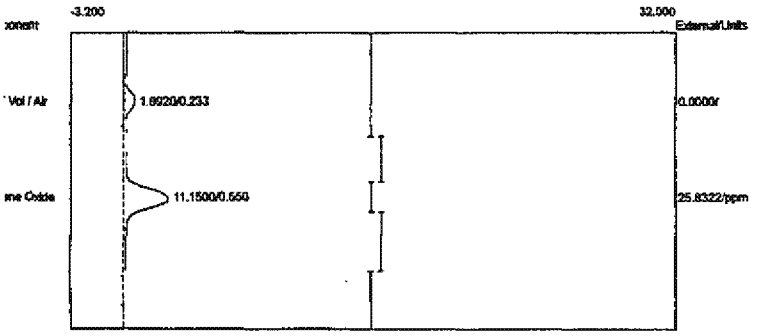
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9660	0.0000	
ylene Oxide	0.566	11.1215	25.7662	ppm
		13.0875	25.7662	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:10:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A03.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



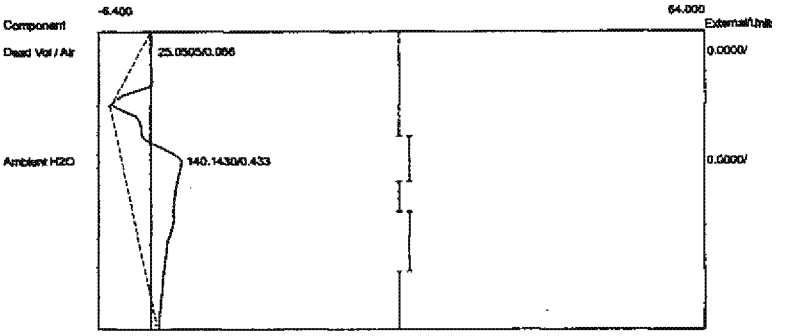
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	27.8120	0.0000	
Ambient H2O	0.450	139.2190	0.0000	
		167.0310	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:15:17
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
'omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A04.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



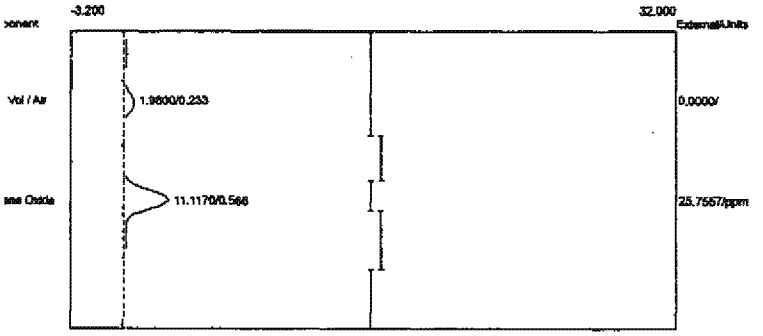
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9920	0.0000	
ıylene Oxide	0.550	11.1500	25.8322	ppm
		13.1420	25.8322	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:15:17
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A04.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



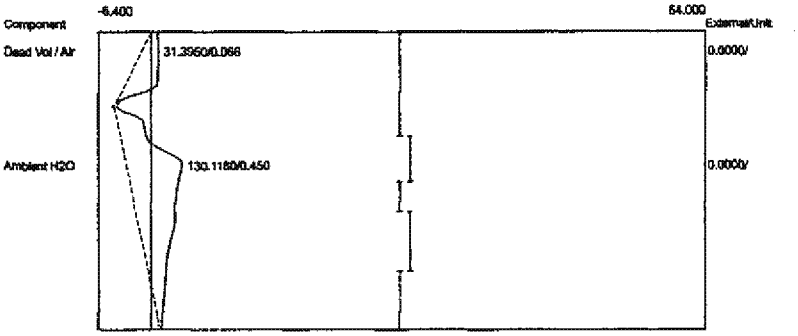
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	25.0505	0.0000	
Ambient H2O	0.433	140.1430	0.0000	
		165.1935	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:20:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A05.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



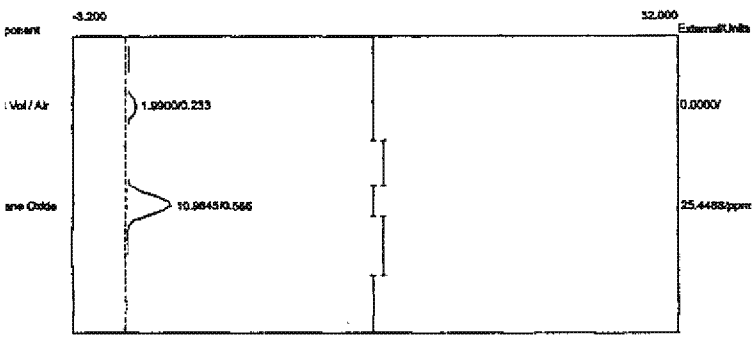
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9800	0.0000	
ıylene Oxide	0.566	11.1170	25.7557	ppm
		13.0970	25.7557	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:20:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A05.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



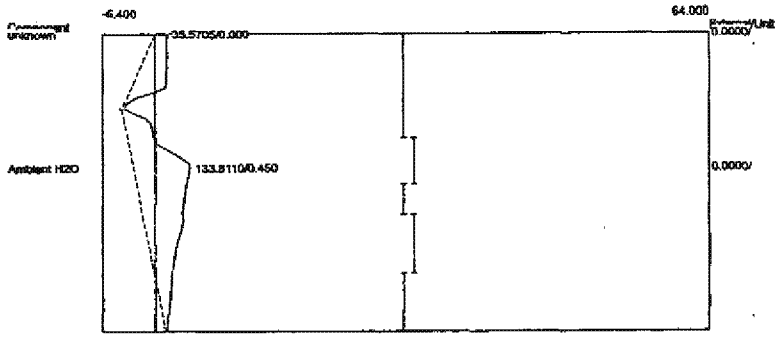
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	31.3950	0.0000	
Ambient H2O	0.450	130.1180	0.0000	
		161.5130	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:25:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A06.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



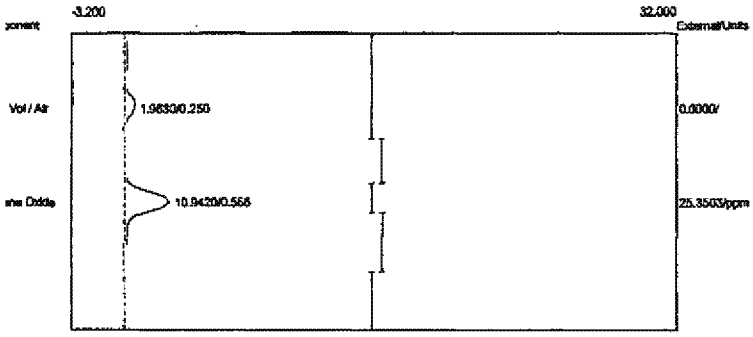
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9900	0.0000	
ıylene Oxide	0.566	10.9845	25.4488	ppm
		12.9745	25.4488	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:25:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A06.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



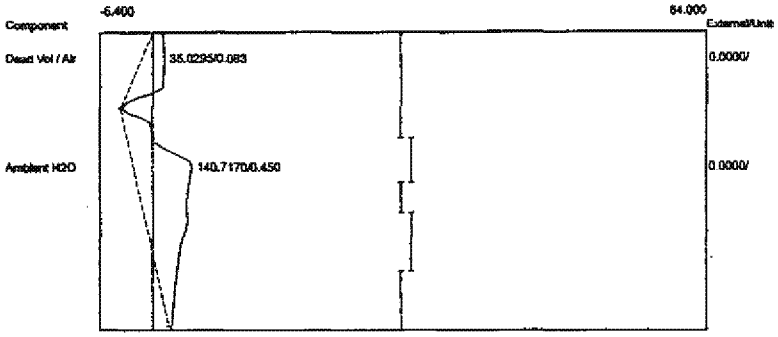
Component	Retention	Area	External	Units
Ambient H2O	0.450	133.8110	0.0000	
		133.8110	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:30:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A07.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



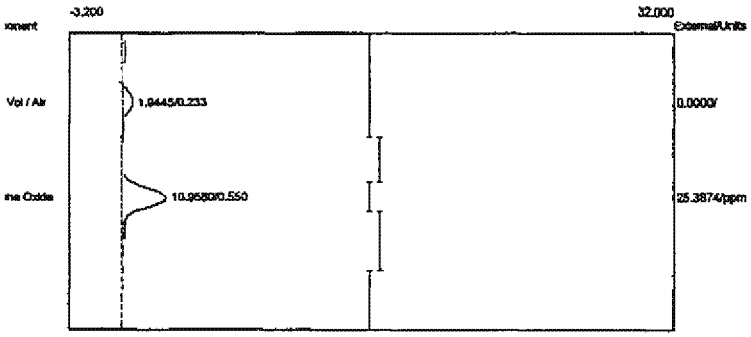
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9630	0.0000	
ylene Oxide	0.566	10.9420	25.3503	ppm
		12.9050	25.3503	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:30:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A07.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



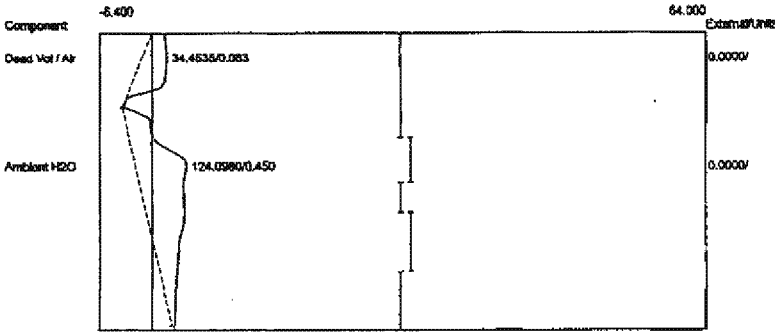
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	35.0295	0.0000	
Ambient H2O	0.450	140.7170	0.0000	
		175.7465	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
ıalysis date: 12/13/2016 11:35:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A08.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



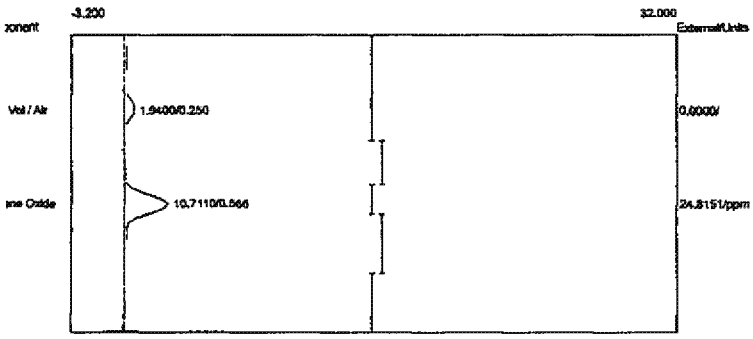
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9445	0.0000	
ıylene Oxide	0.550	10.9580	25.3874	ppm
		12.9025	25.3874	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:35:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A08.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



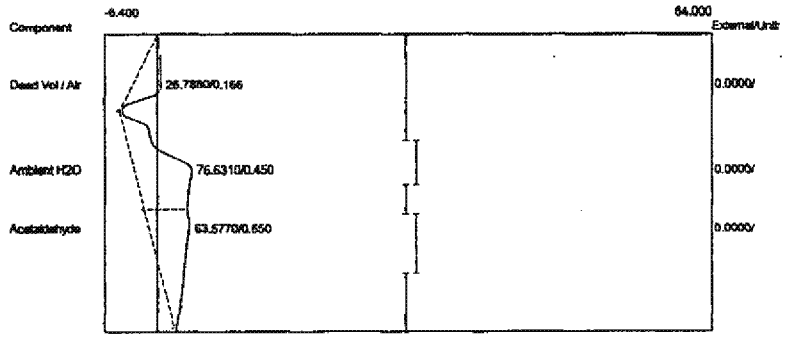
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	34.4535	0.0000	
Ambient H2O	0.450	124.0980	0.0000	
		158.5515	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:40:26
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1Ster2WB2016-2A09.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



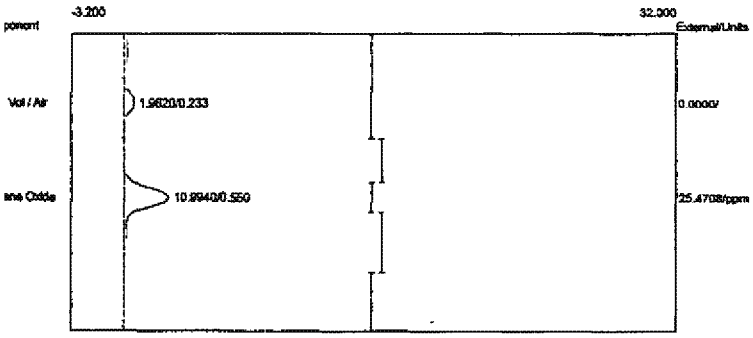
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9400	0.0000	
ylene Oxide	0.566	10.7110	24.8151	ppm
		12.6510	24.8151	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:40:26
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A09.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



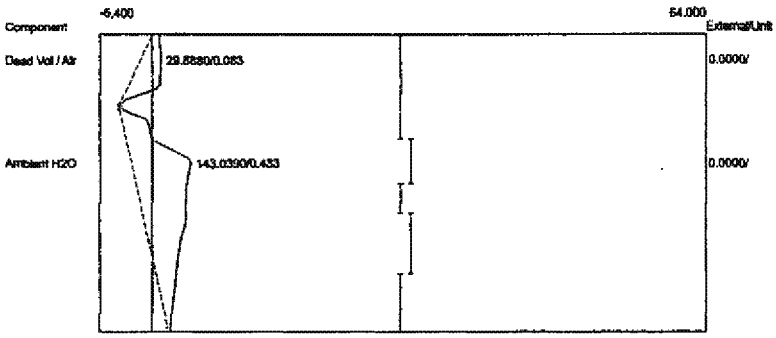
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	26.7880	0.0000	
Ambient H2O	0.450	76.6310	0.0000	
Acetaldehyde	0.650	63.5770	0.0000	
		166.9960	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:45:15
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A10.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



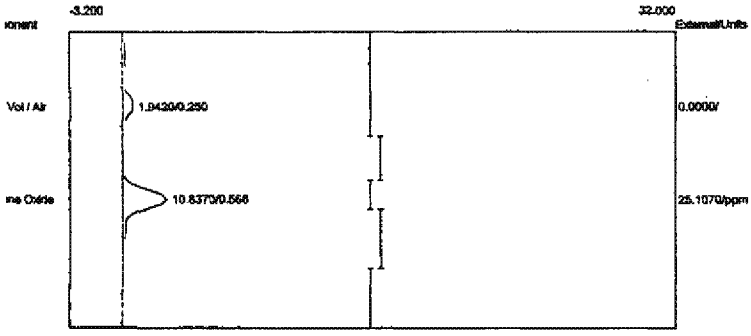
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9620	0.0000	
ylene Oxide	0.550	10.9940	25.4708	ppm
		12.9560	25.4708	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:45:15
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A10.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



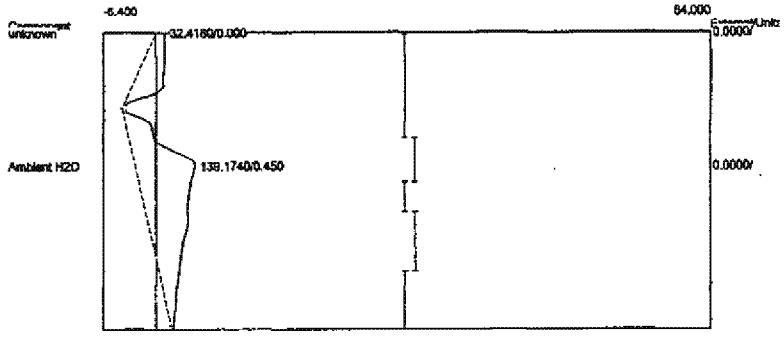
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	29.8880	0.0000	
Ambient H2O	0.433	143.0390	0.0000	
		172.9270	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
ıalysis date: 12/13/2016 11:50:13
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A11.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



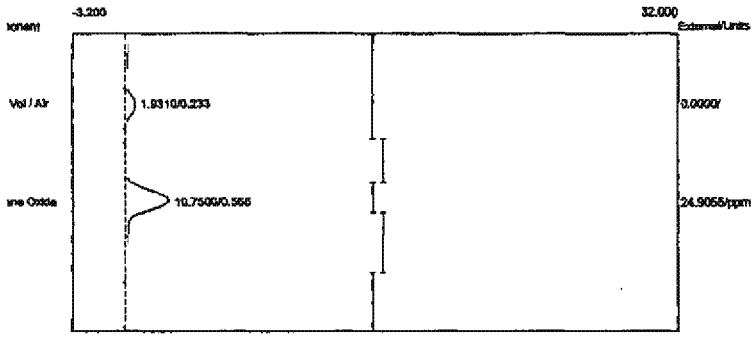
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9420	0.0000	
ıytene Oxide	0.566	10.8370	25.1070	ppm
		12.7790	25.1070	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:50:13
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A11.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



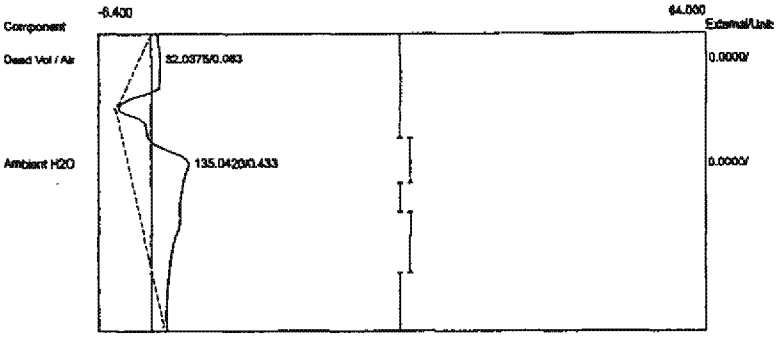
Component	Retention	Area	External	Units
Ambient H2O	0.450	139.1740	0.0000	
		139.1740	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
nalysis date: 12/13/2016 11:55:04
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-2A12.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9310	0.0000	
ylene Oxide	0.566	10.7500	24.9055	ppm
		12.6810	24.9055	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Aer
Analysis date: 12/13/2016 11:55:04
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2A12.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



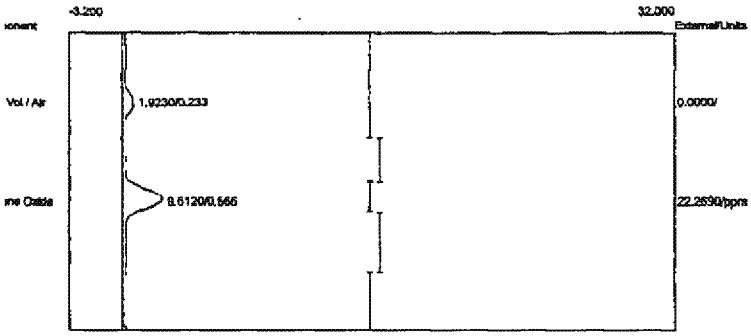
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	32.0375	0.0000	
Ambient H2O	0.433	135.0420	0.0000	
		167.0795	0.0000	

APPENDIX D

Run#3 Chromatograms - Aeration

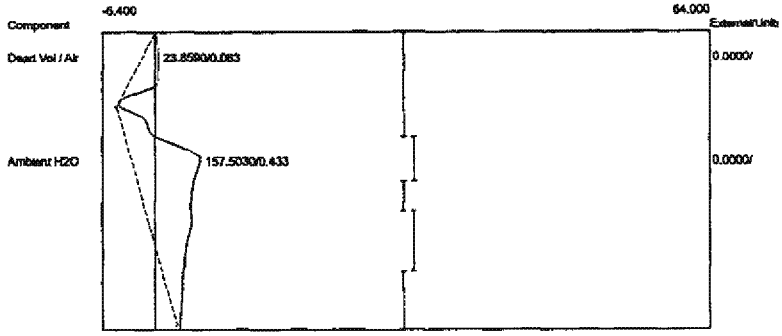
ECSi

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
ıalysis date: 12/13/2016 15:34:55
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-3A01.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



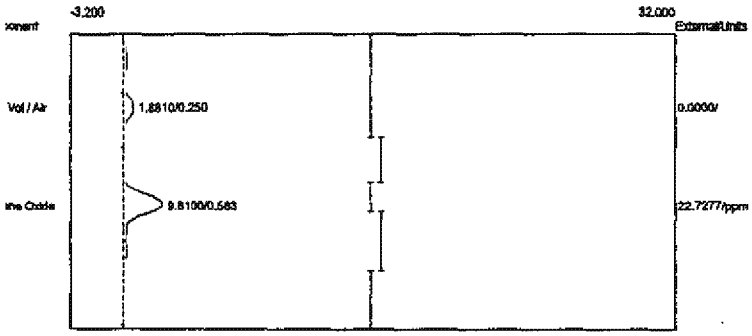
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9230	0.0000	
ıylene Oxide	0.566	9.6120	22.2690	ppm
		11.5350	22.2690	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 15:34:55
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A01.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



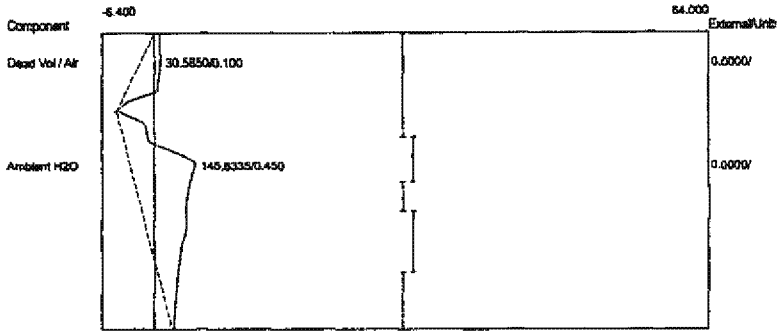
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	23.8590	0.0000	
Ambient H2O	0.433	157.5030	0.0000	
		181.3620	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 15:39:40
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-3A02.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



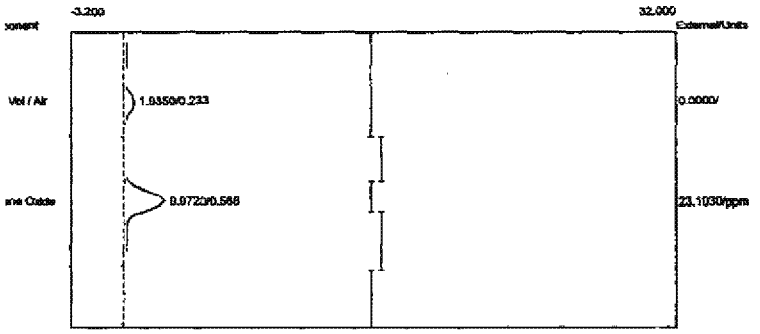
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.8810	0.0000	
ylene Oxide	0.583	9.8100	22.7277	ppm
		11.6910	22.7277	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 15:39:40
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A02.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



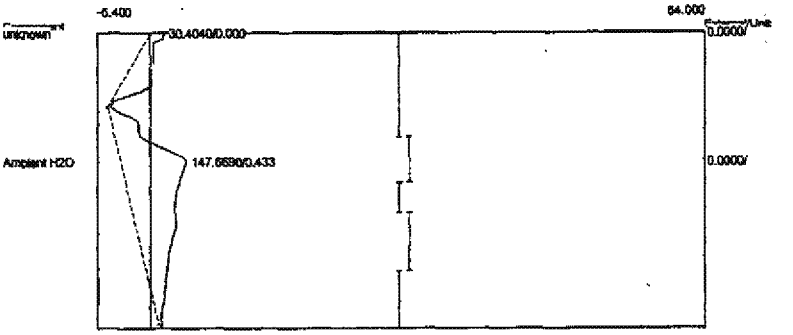
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	30.5850	0.0000	
Ambient H2O	0.450	145.8335	0.0000	
		176.4185	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 15:44:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-3A03.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



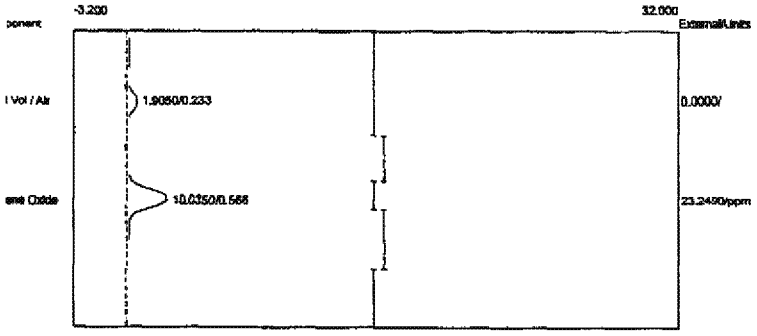
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9350	0.0000	
ylene Oxide	0.566	9.9720	23.1030	ppm
		11.9070	23.1030	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 15:44:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A03.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



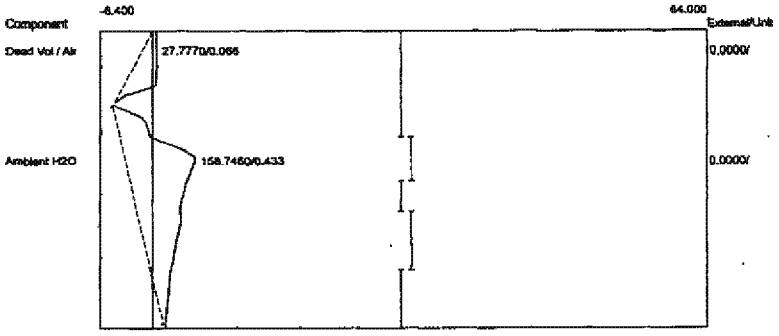
Component	Retention	Area	External	Units
Ambient H2O	0.433	147.6690	0.0000	
		147.6690	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 15:49:15
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-3A04.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



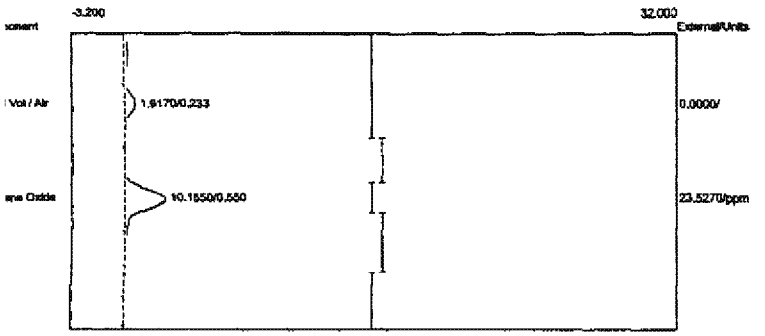
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9050	0.0000	
ıylene Oxide	0.566	10.0350	23.2490	ppm
		11.9400	23.2490	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 15:49:15
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A04.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



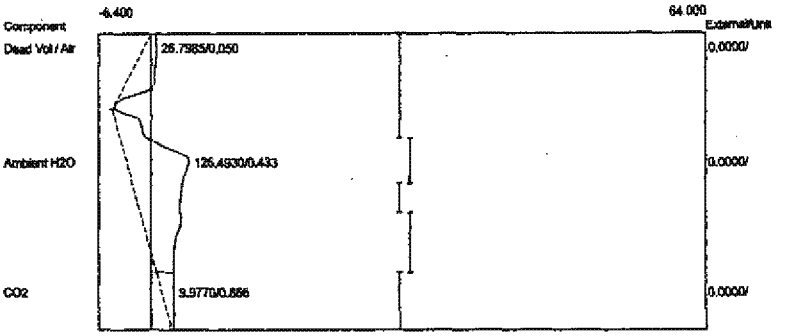
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	27.7770	0.0000	
Ambient H2O	0.433	158.7460	0.0000	
		186.5230	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 15:54:20
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-3A05.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



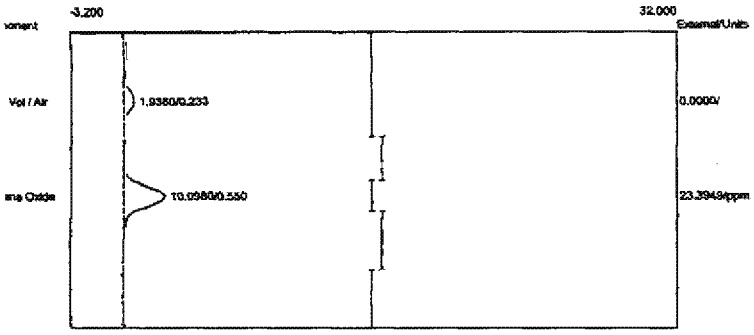
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9170	0.0000	
ylene Oxide	0.550	10.1550	23.5270	ppm
		12.0720	23.5270	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 15:54:20
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A05.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



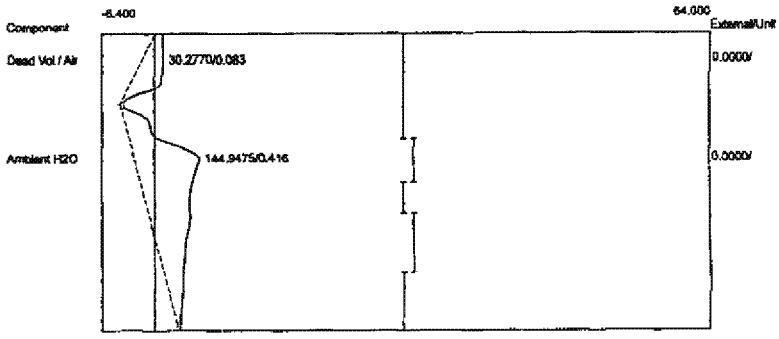
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	26.7985	0.0000	
Ambient H2O	0.433	126.4930	0.0000	
CO2	0.866	9.9770	0.0000	
		163.2685	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 15:59:16
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-3A06.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



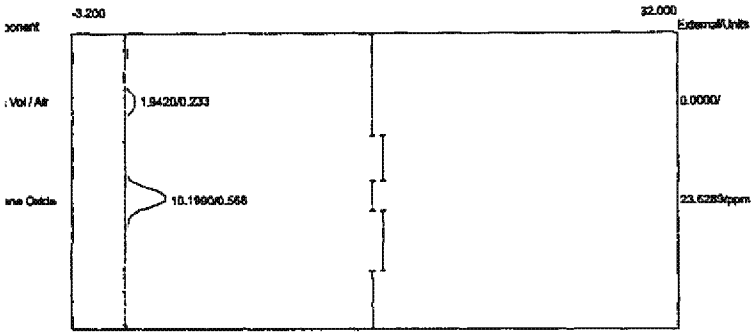
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9360	0.0000	
ylene Oxide	0.550	10.0980	23.3949	ppm
		12.0340	23.3949	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 15:59:16
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A06.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



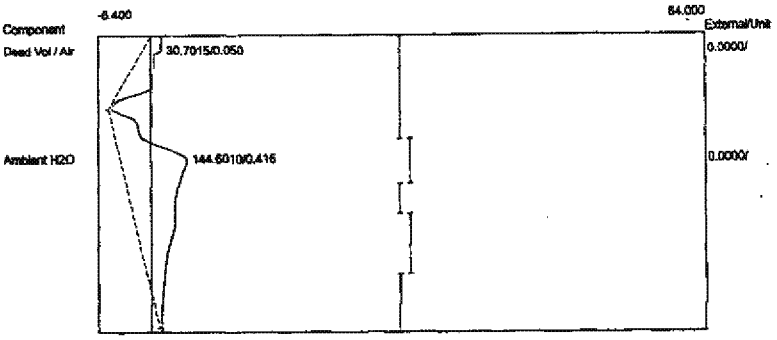
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	30.2770	0.0000	
Ambient H2O	0.416	144.9475	0.0000	
		175.2245	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 16:04:06
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-3A07.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



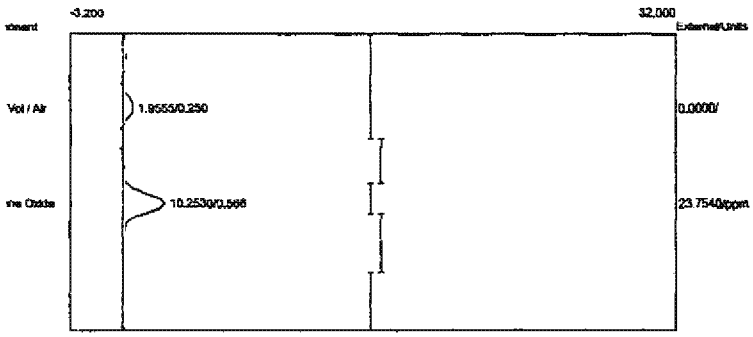
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9420	0.0000	
ıylene Oxide	0.566	10.1990	23.6289	ppm
		12.1410	23.6289	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 16:04:06
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A07.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



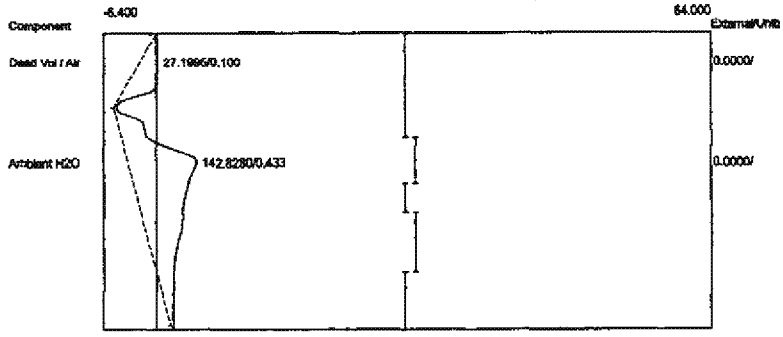
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	30.7015	0.0000	
Ambient H2O	0.416	144.6010	0.0000	
		175.3025	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
ıalysis date: 12/13/2016 16:09:04
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto1-100.cpt
Data file: 1Ster2WB2016-3A08.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



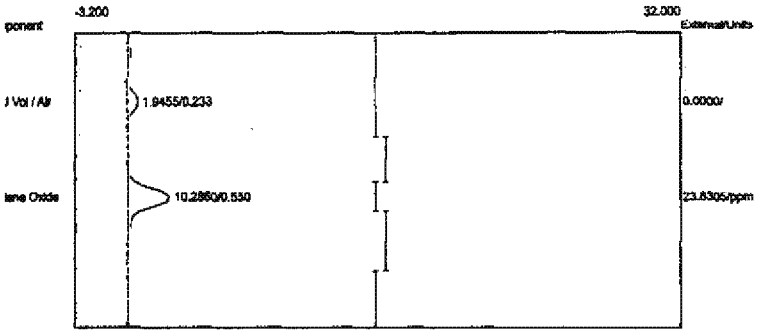
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9555	0.0000	
ıylene Oxide	0.566	10.2530	23.7540	ppm
		12.2085	23.7540	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 16:09:04
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A08.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



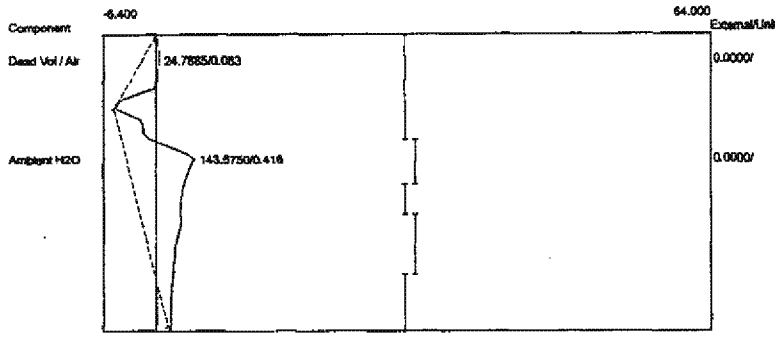
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	27.1995	0.0000	
Ambient H2O	0.433	142.8280	0.0000	
		170.0275	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 16:14:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1Ster2WB2016-3A09.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



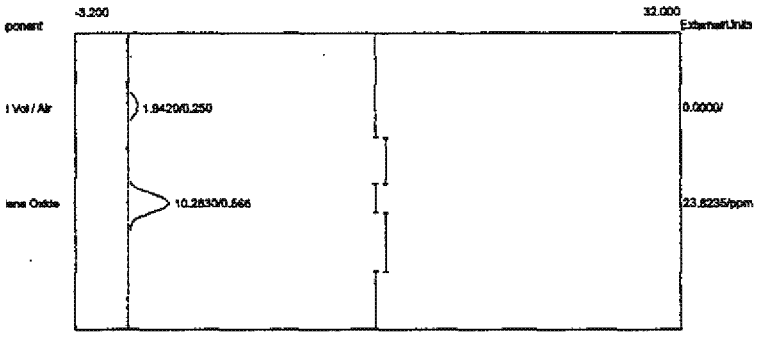
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9455	0.0000	
ylene Oxide	0.550	10.2860	23.8305	ppm
		12.2315	23.8305	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 16:14:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A09.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



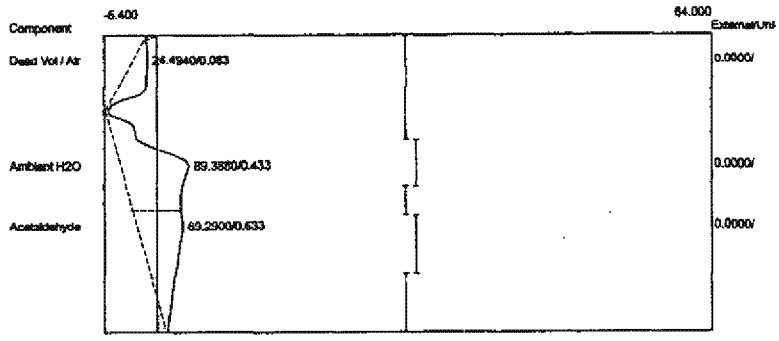
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	24.7885	0.0000	
Ambient H2O	0.416	143.6750	0.0000	
		168.4635	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 16:19:30
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1Ster2WB2016-3A10.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



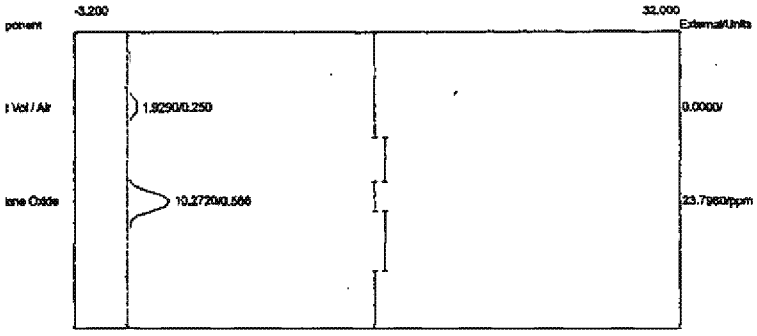
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.9420	0.0000	
ylene Oxide	0.566	10.2830	23.8235	ppm
		12.2250	23.8235	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 16:19:30
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A10.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



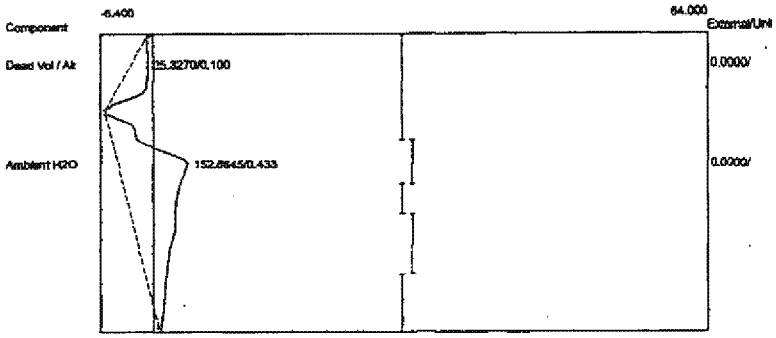
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	24.4940	0.0000	
Ambient H2O	0.433	89.3880	0.0000	
Acetaldehyde	0.633	69.2900	0.0000	
		183.1720	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 16:24:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1Ster2WB2016-3A11.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



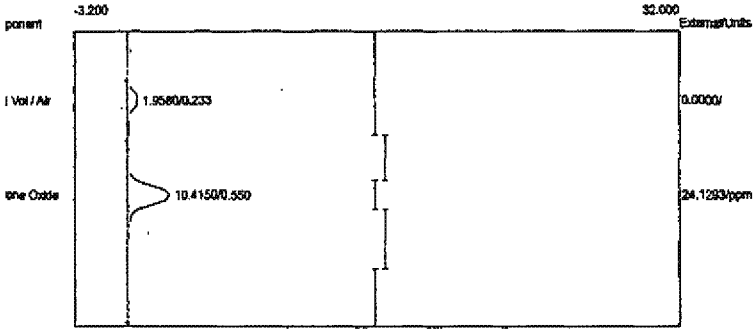
Component	Retention	Area	External	Units
ead Vol / Air	0.250	1.9290	0.0000	
ylene Oxide	0.566	10.2720	23.7980	ppm
		12.2010	23.7980	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 16:24:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A11.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



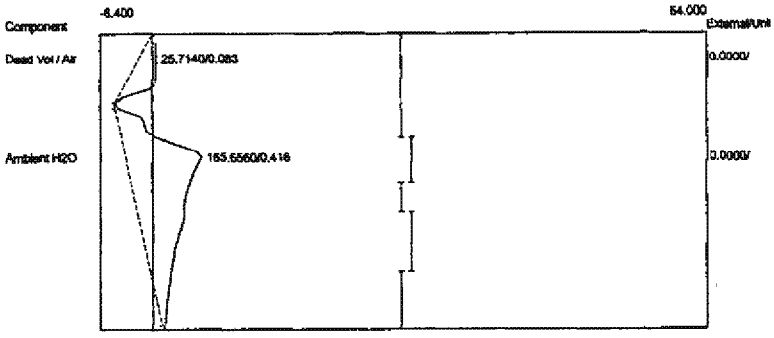
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	25.3270	0.0000	
Ambient H2O	0.433	152.8645	0.0000	
		178.1915	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
nalysis date: 12/13/2016 16:29:17
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto1-100.cpt
Data file: 1Ster2WB2016-3A12.CHR (c:\peak359)
Sample: AAT Safe Cell Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.9580	0.0000	
ylene Oxide	0.550	10.4150	24.1293	ppm
		12.3730	24.1293	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Aer
Analysis date: 12/13/2016 16:29:17
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-3A12.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



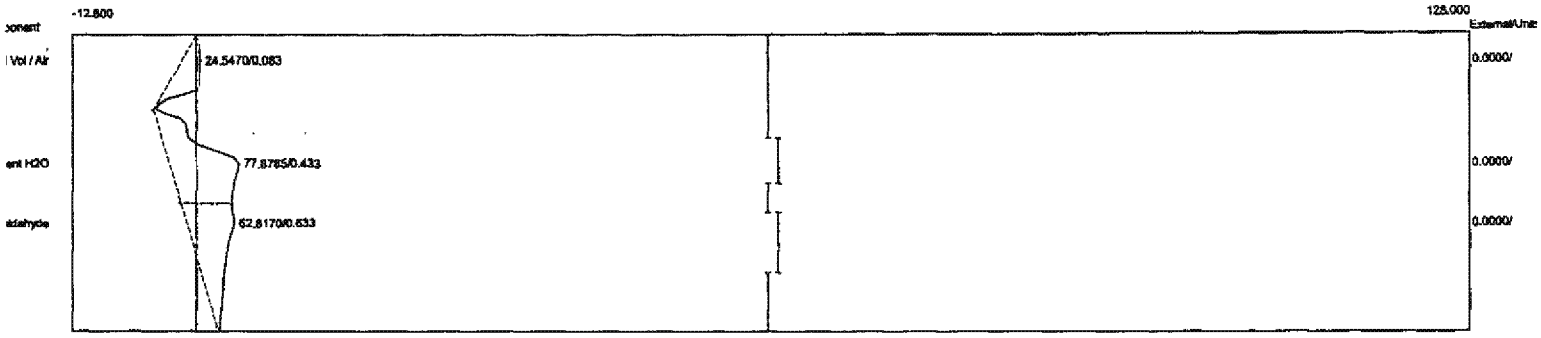
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	25.7140	0.0000	
Ambient H2O	0.416	165.6560	0.0000	
		191.3700	0.0000	

APPENDIX E

Run#1 Chromatograms - Exhaust

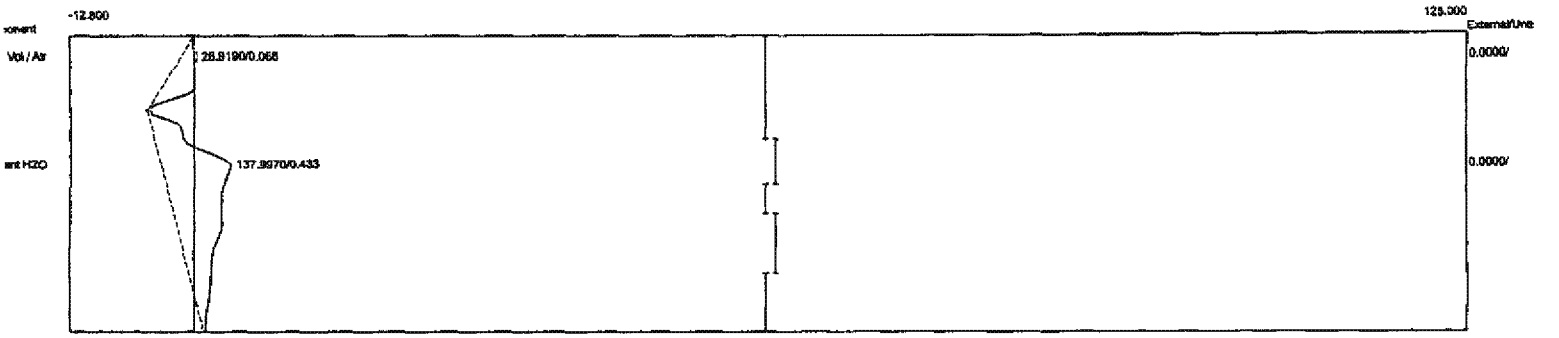
ECSi

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Exh
nalysis date: 12/13/2016 12:50:57
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster2WB2016-1E01.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



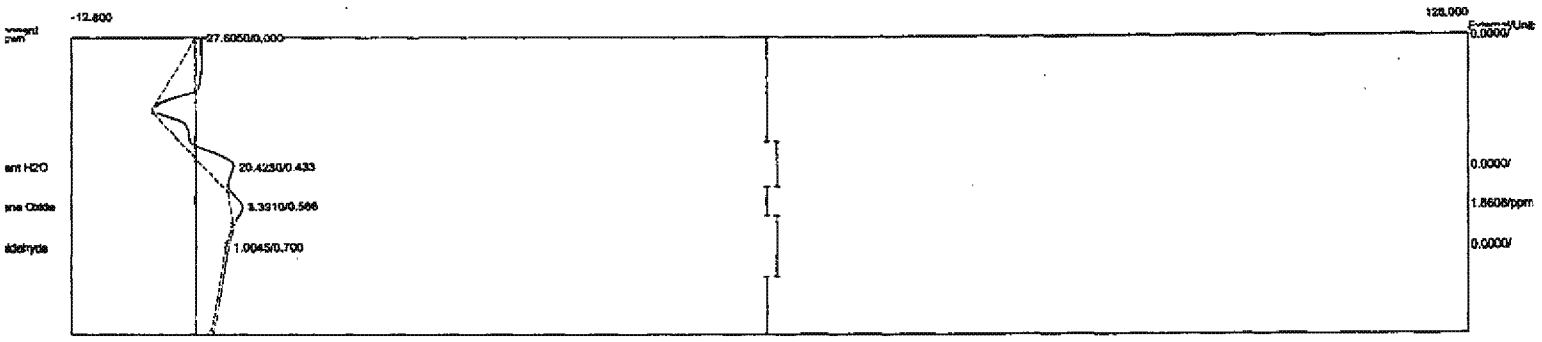
Component	Retention	Area	External	Units
ad Vol / Air	0.083	24.5470	0.0000	
ıbient H2O	0.433	77.8785	0.0000	
etaldehyde	0.633	62.8170	0.0000	
		165.2425	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Exh
nalysis date: 12/13/2016 12:52:07
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-1E02.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



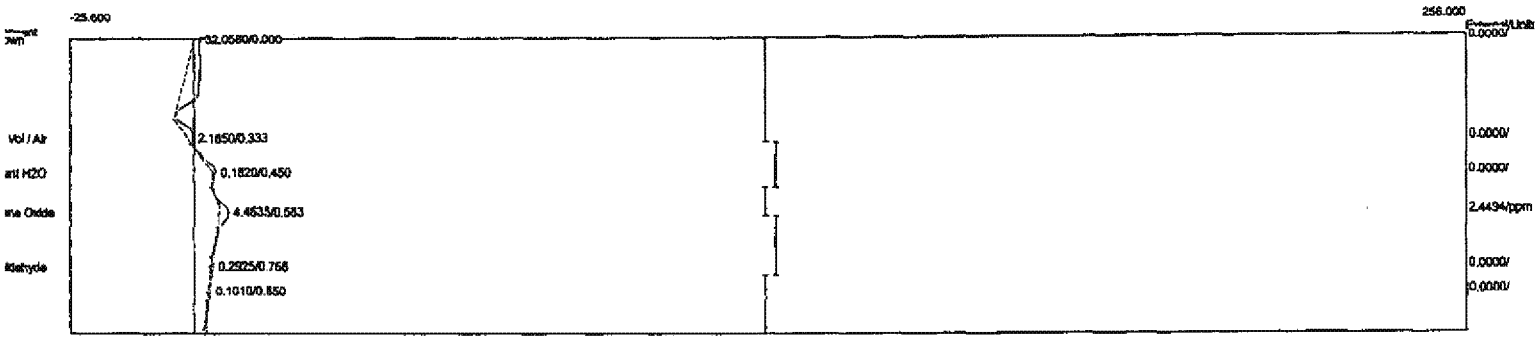
Component	Retention	Area	External	Units
ad Vol / Air	0.066	26.9190	0.0000	
ibient H2O	0.433	137.9970	0.0000	
		164.9160	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Exh
nalysis date: 12/13/2016 12:53:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1E03.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



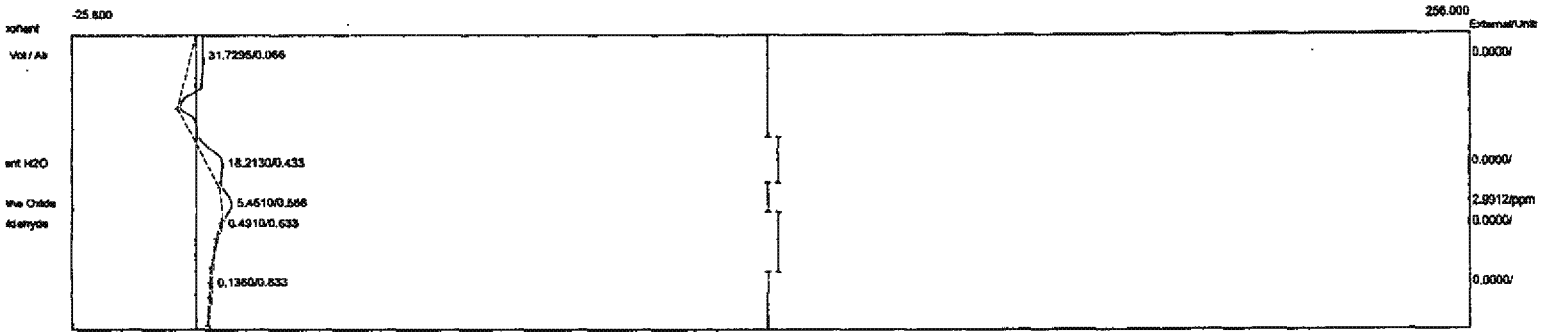
Component	Retention	Area	External	Units
ıbient H2O	0.433	20.4230	0.0000	
ıylene Oxide	0.566	3.3910	1.8608	ppm
etaldehyde	0.700	1.0045	0.0000	
		24.8185	1.8608	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Exh
nalysis date: 12/13/2016 12:54:27
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-1E04.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



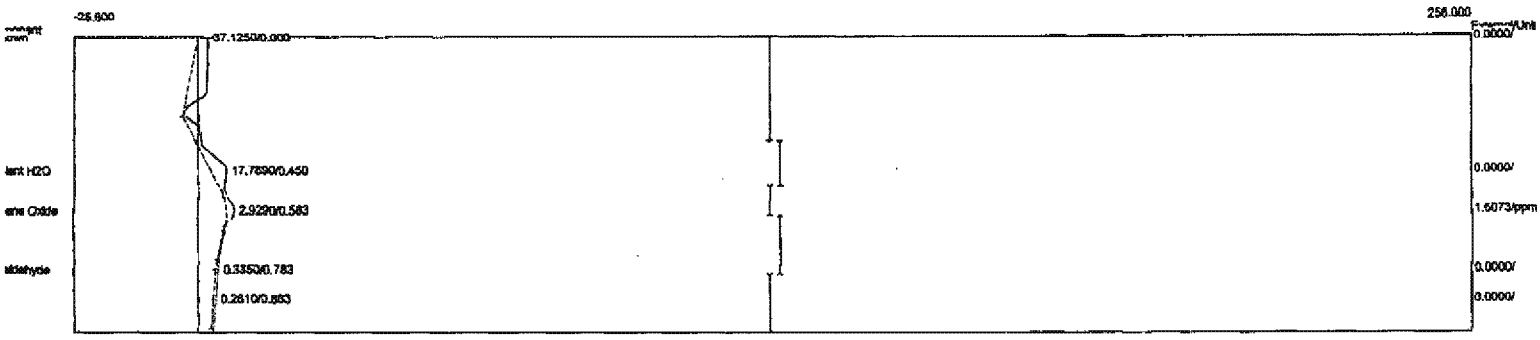
Component	Retention	Area	External	Units
ad Vol / Air	0.333	2.1650	0.0000	
ıbient H2O	0.450	0.1820	0.0000	
ıylene Oxide	0.583	4.4635	2.4494	ppm
etaldehyde	0.766	0.2925	0.0000	
)2	0.850	0.1010	0.0000	
		7.2040	2.4494	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Exh
nalysis date: 12/13/2016 12:55:46
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-1E05.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



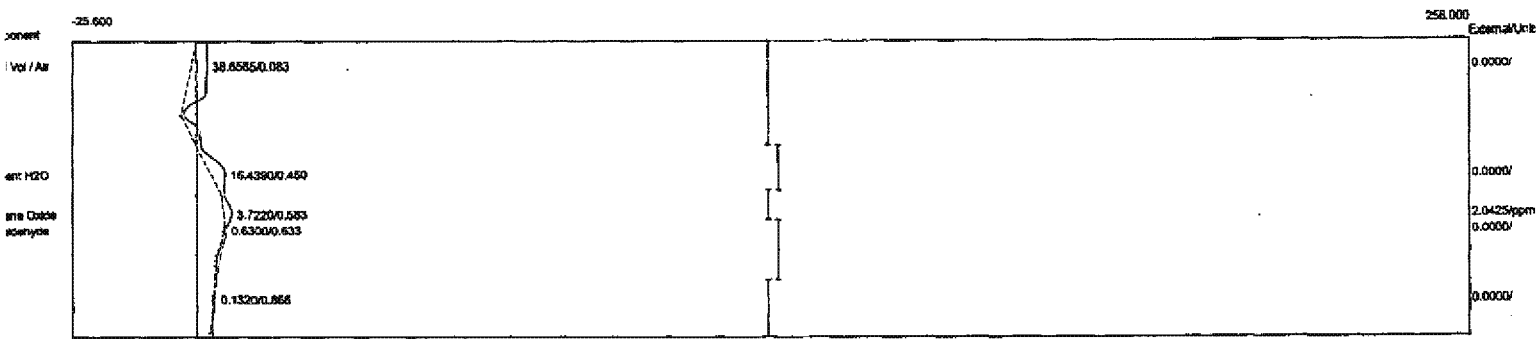
Component	Retention	Area	External	Units
ad Vol / Air	0.066	31.7295	0.0000	
ıbient H2O	0.433	18.2130	0.0000	
ıylene Oxide	0.566	5.4510	2.9912	ppm
etaldehyde	0.633	0.4910	0.0000	
›2	0.833	0.1360	0.0000	
		56.0205	2.9912	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Exh
nalysis date: 12/13/2016 12:56:59
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1E06.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



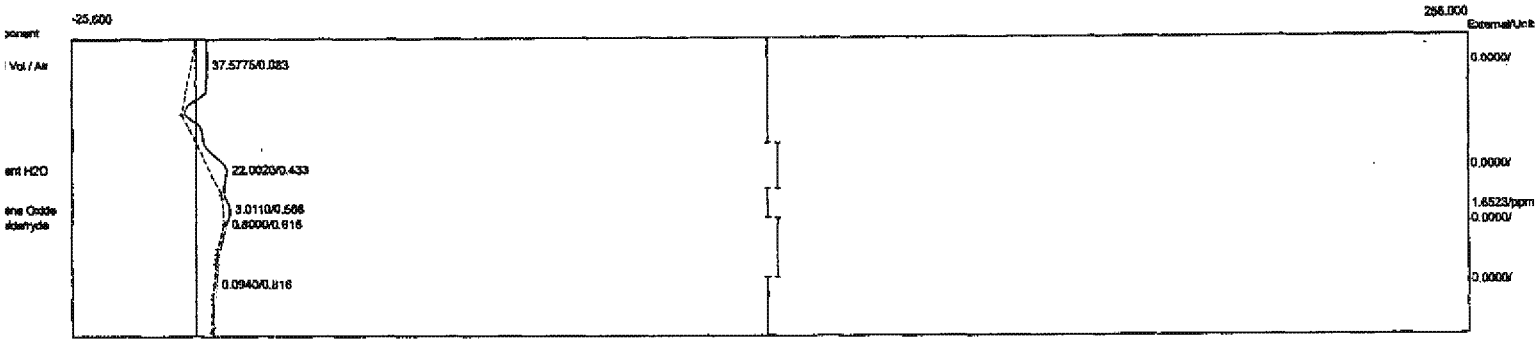
Component	Retention	Area	External	Units
ıbient H2O	0.450	17.7890	0.0000	
ıylene Oxide	0.583	2.9290	1.6073	ppm
etaldehyde	0.783	0.3350	0.0000	
)2	0.883	0.2610	0.0000	
		21.3140	1.6073	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Exh
nalysis date: 12/13/2016 12:58:16
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster2WB2016-1E07.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



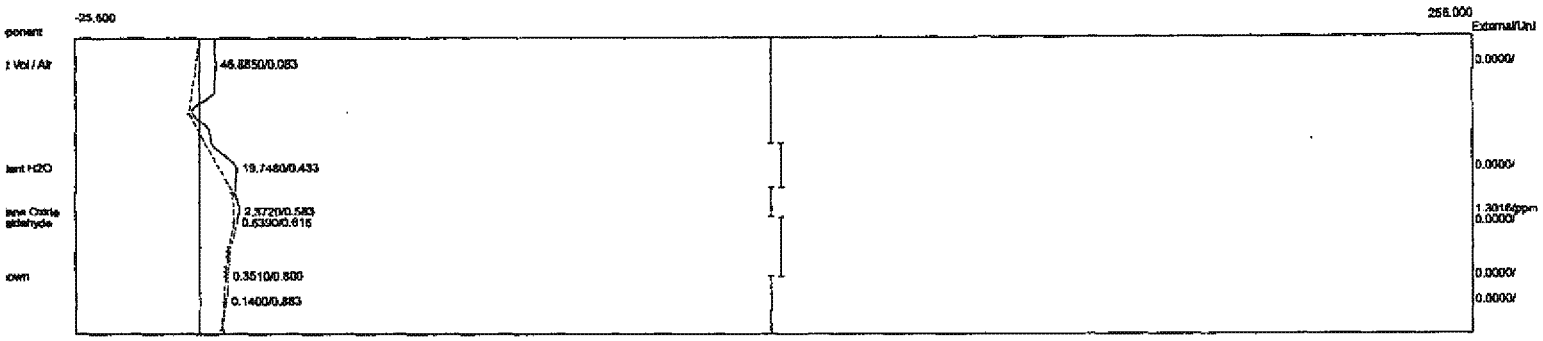
Component	Retention	Area	External	Units
ad Vol / Air	0.083	38.6585	0.0000	
ıbient H2O	0.450	16.4390	0.0000	
ıylene Oxide	0.583	3.7220	2.0425	ppm
etaldehyde	0.633	0.6300	0.0000	
)2	0.866	0.1320	0.0000	
		59.5815	2.0425	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Exh
nalysis date: 12/13/2016 12:59:38
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster2WB2016-1E08.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.083	37.5775	0.0000	
ıbient H2O	0.433	22.0020	0.0000	
ıylene Oxide	0.566	3.0110	1.6523	ppm
etaldehyde	0.616	0.8000	0.0000	
)2	0.816	0.0940	0.0000	
		63.4845	1.6523	

Client: Sterigenics - Willowbrook 2
Client ID: Run#1Exh
nalysis date: 12/13/2016 13:00:50
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-1E09.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer

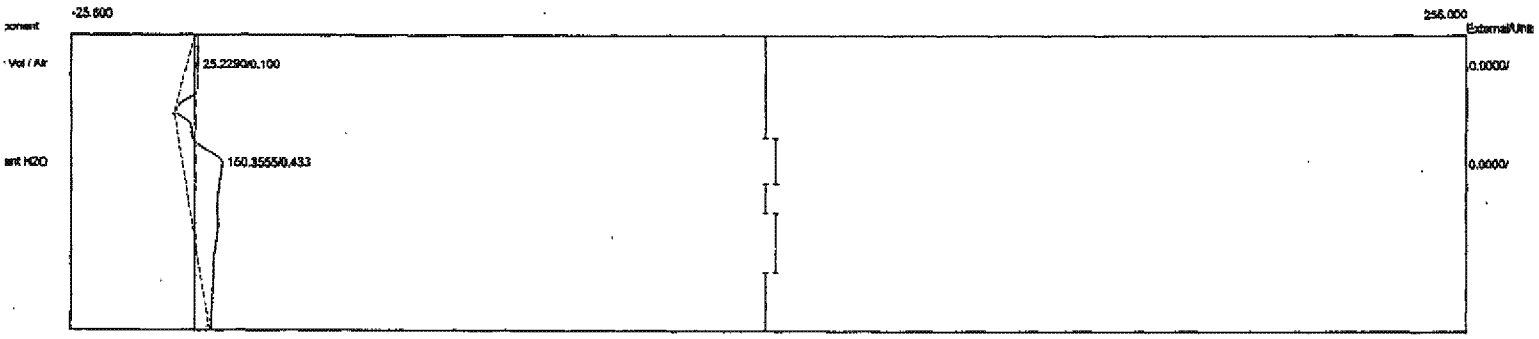


Component	Retention	Area	External	Units
ead Vol / Air	0.083	46.8850	0.0000	
nbient H2O	0.433	19.7480	0.0000	
ylene Oxide	0.583	2.3720	1.3016	ppm
etaldehyde	0.616	0.6390	0.0000	
)2	0.883	0.1400	0.0000	
		69.7840	1.3016	

APPENDIX F

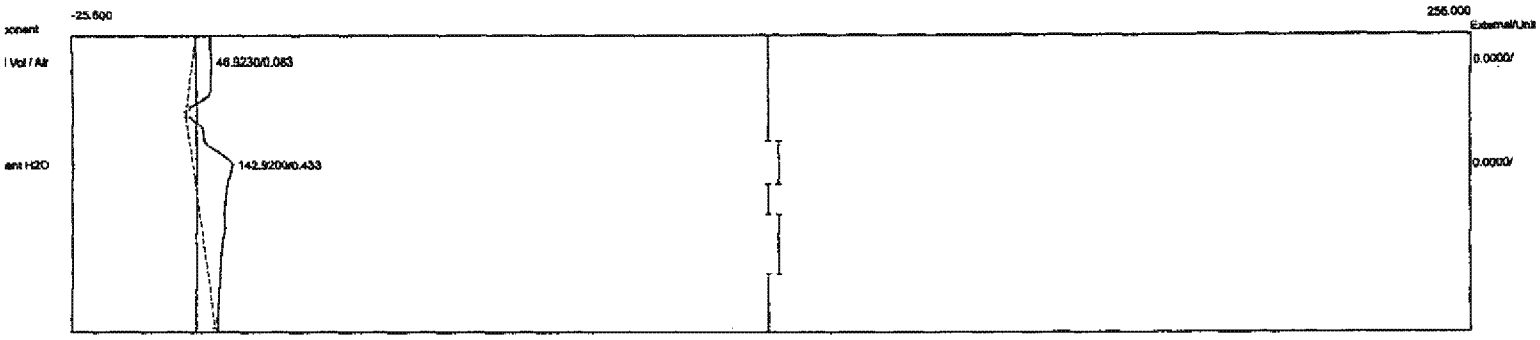
Run#2 Chromatograms - Exhaust

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Exh
nalysis date: 12/13/2016 17:07:23
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster2WB2016-2E01.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



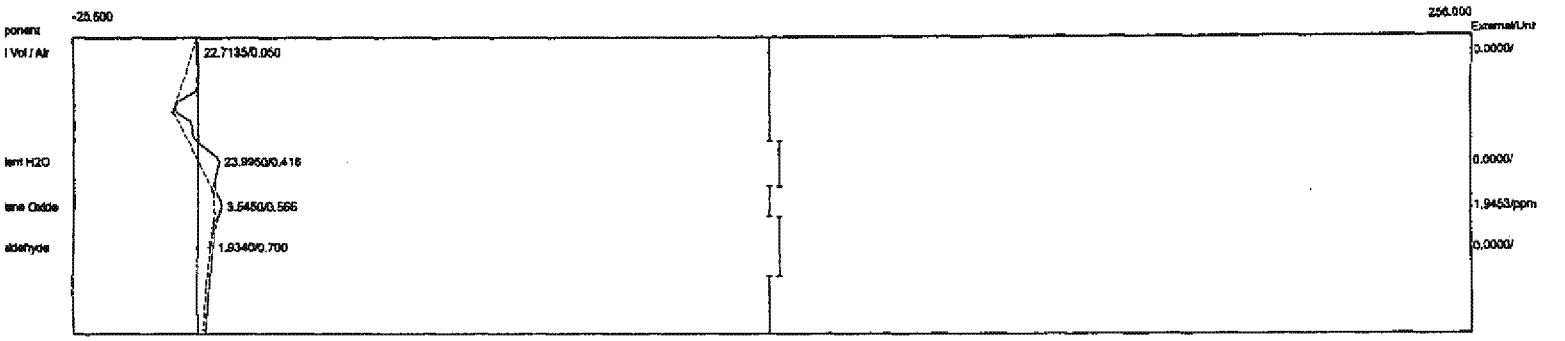
Component	Retention	Area	External	Units
ad Vol / Air	0.100	25.2290	0.0000	
ıbient H2O	0.433	150.3555	0.0000	
		175.5845	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Exh
nalysis date: 12/13/2016 17:08:31
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100:tem
:omponents: eto2-100.cpt
Data file: 2Ster2WB2016-2E02.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



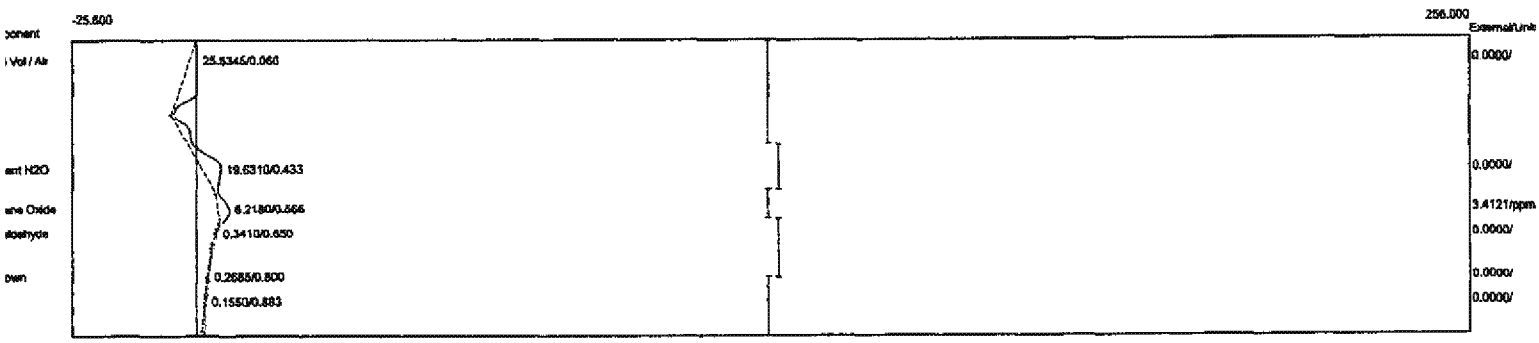
Component	Retention	Area	External	Units
ad Vol / Air	0.083	46.9230	0.0000	
ıbient H2O	0.433	142.9200	0.0000	
		189.8430	0.0000	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Exh
nalysis date: 12/13/2016 17:09:39
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2E03.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



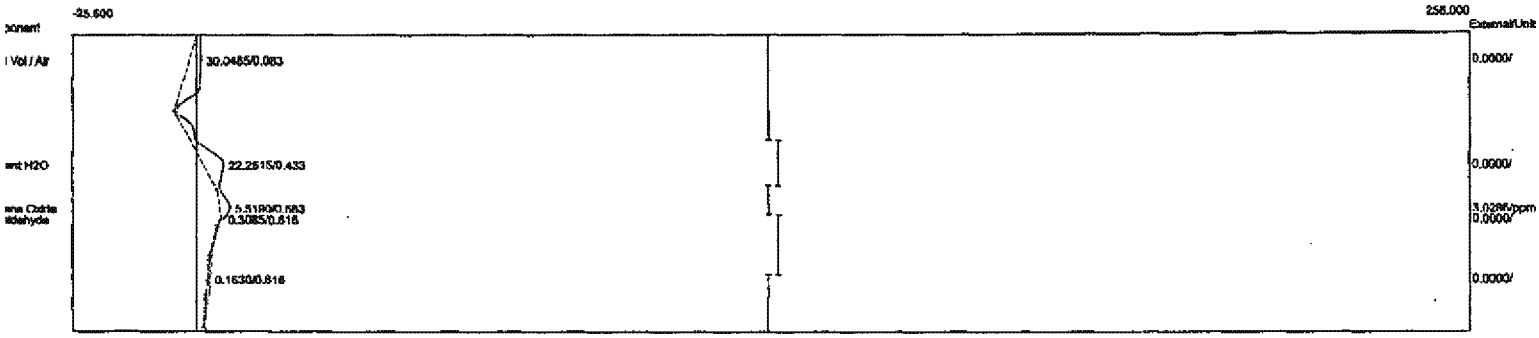
Component	Retention	Area	External	Units
ead Vol / Air	0.050	22.7135	0.0000	
nbient H2O	0.416	23.9950	0.0000	
ylene Oxide	0.566	3.5450	1.9453	ppm
etaldehyde	0.700	1.9340	0.0000	
		52.1875	1.9453	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Exh
nalysis date: 12/13/2016 17:11:02
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-2E04.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



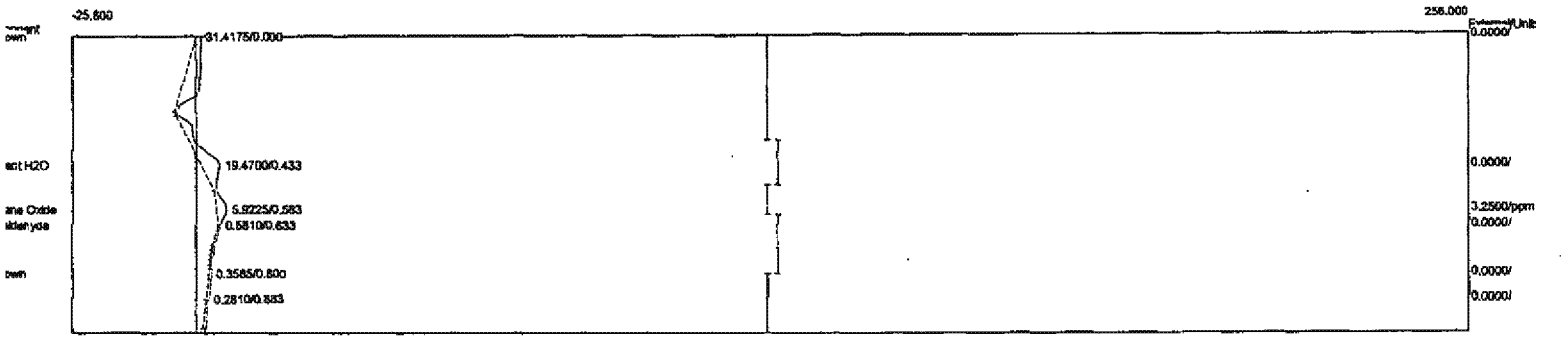
Component	Retention	Area	External	Units
ad Vol / Air	0.066	25.5345	0.0000	
ıbient H2O	0.433	19.6310	0.0000	
ıylene Oxide	0.566	6.2180	3.4121	ppm
etaldehyde	0.650	0.3410	0.0000	
)2	0.883	0.1550	0.0000	
		51.8795	3.4121	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Exh
nalysis date: 12/13/2016 17:12:13
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-2E05.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



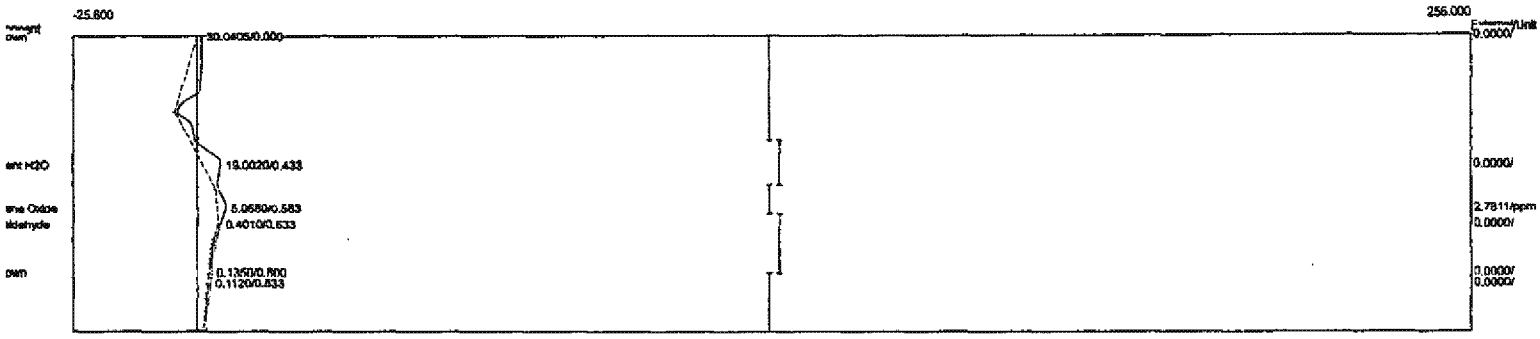
Component	Retention	Area	External	Units
ad Vol / Air	0.083	30.0485	0.0000	
ıbient H2O	0.433	22.2615	0.0000	
ıylene Oxide	0.583	5.5190	3.0286	ppm
etaldehyde	0.616	0.3085	0.0000	
)2	0.816	0.1630	0.0000	
		58.3005	3.0286	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Exh
ıalysis date: 12/13/2016 17:13:23
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
'omponents: eto2-100.cpt
Data file: 2Ster2WB2016-2E06.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



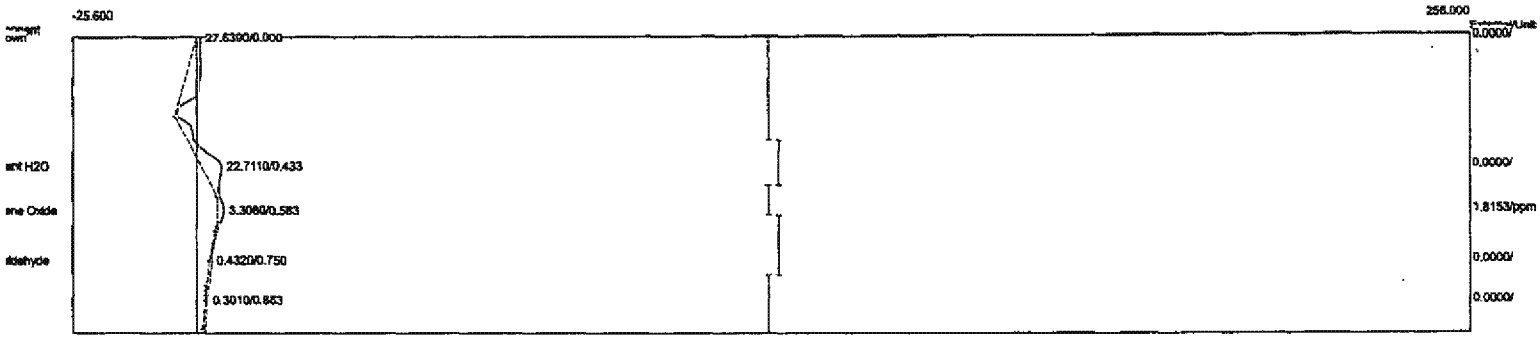
Component	Retention	Area	External	Units
ıbient H2O	0.433	19.4700	0.0000	
ıylene Oxide	0.583	5.9225	3.2500	ppm
etaldehyde	0.633	0.5810	0.0000	
)2	0.883	0.2810	0.0000	
		26.2545	3.2500	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Exh
nalysis date: 12/13/2016 17:14:37
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
'omponents: eto2-100.cpt
Data file: 2Ster2WB2016-2E07.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



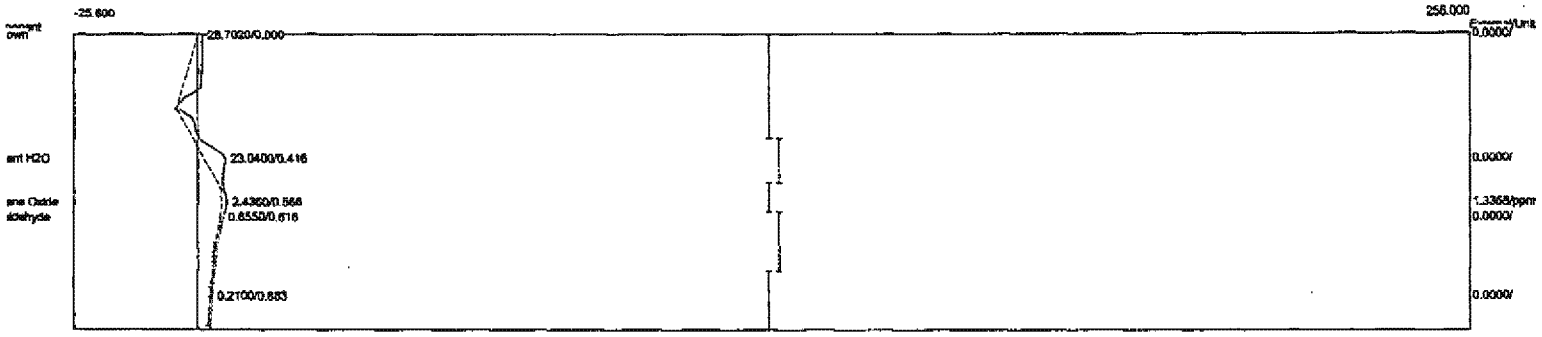
Component	Retention	Area	External	Units
ıbient H2O	0.433	19.0020	0.0000	
ıylene Oxide	0.583	5.0680	2.7811	ppm
etaldehyde	0.633	0.4010	0.0000	
)2	0.833	0.1120	0.0000	
		24.5830	2.7811	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Exh
nalysis date: 12/13/2016 17:15:52
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster2WB2016-2E08.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ıbient H2O	0.433	22.7110	0.0000	
ıylene Oxide	0.583	3.3080	1.8153	ppm
etaldehyde	0.750	0.4320	0.0000	
)2	0.883	0.3010	0.0000	
		26.7520	1.8153	

Client: Sterigenics - Willowbrook 2
Client ID: Run#2Exh
nalysis date: 12/13/2016 17:17:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2Ster2WB2016-2E09.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer

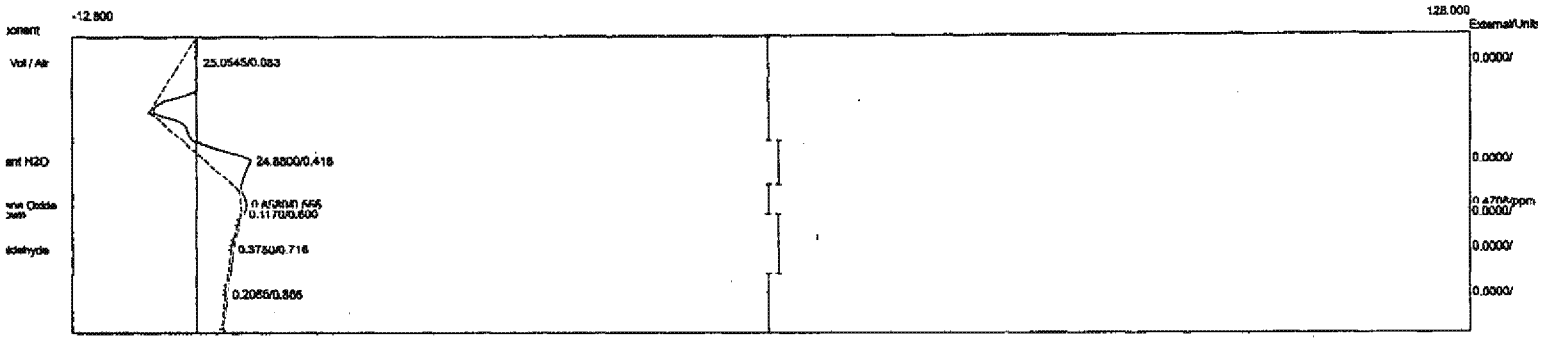


Component	Retention	Area	External	Units
ıbient H2O	0.416	23.0400	0.0000	
ıylene Oxide	0.566	2.4360	1.3368	ppm
etaldehyde	0.616	0.6550	0.0000	
)2	0.883	0.2100	0.0000	
		26.3410	1.3368	

APPENDIX G

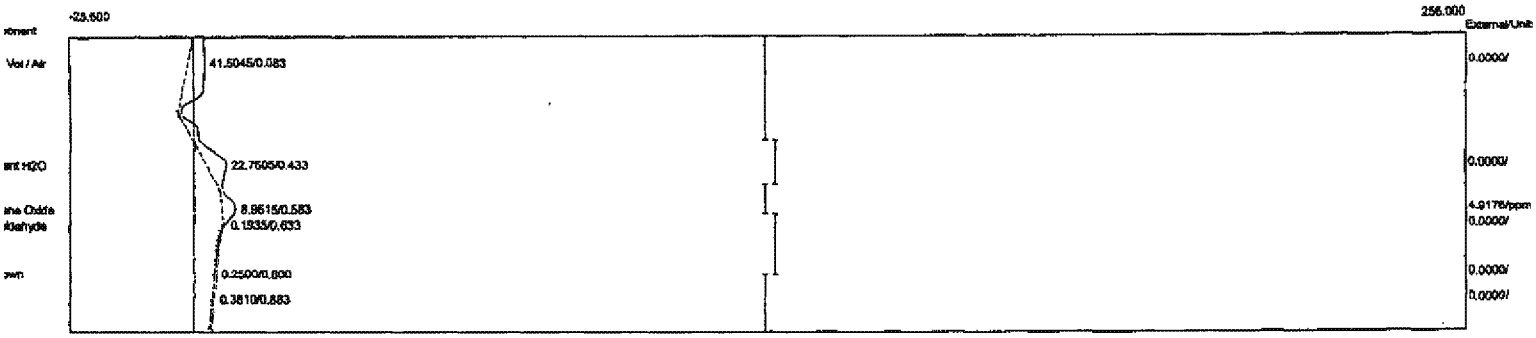
Run#3 Chromatograms - Exhaust

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Exh
nalysis date: 12/13/2016 17:23:03
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-3E01.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



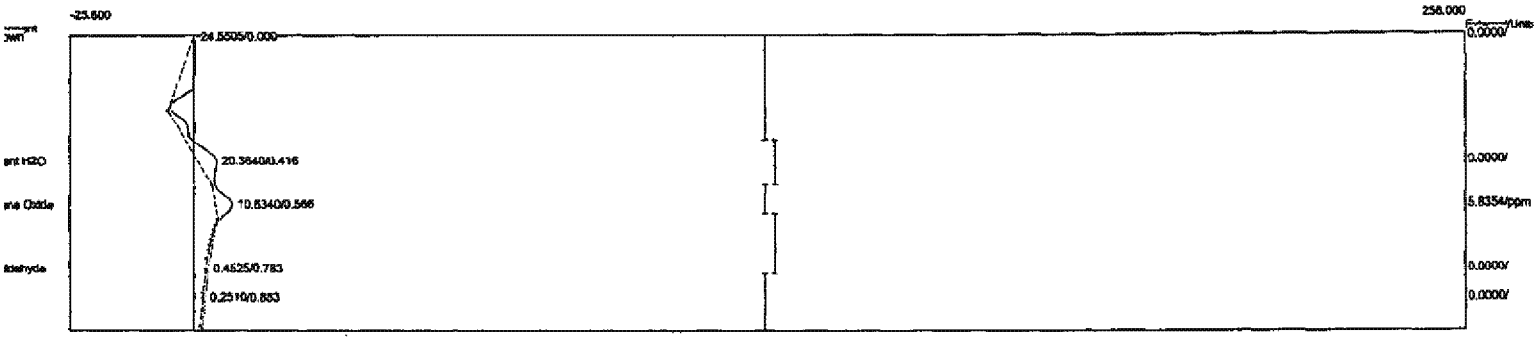
Component	Retention	Area	External	Units
ad Vol / Air	0.083	25.0545	0.0000	
ıbient H2O	0.416	24.8800	0.0000	
ıylene Oxide	0.566	0.8580	0.4708	ppm
etaldehyde	0.716	0.3750	0.0000	
)2	0.866	0.2085	0.0000	
		51.3760	0.4708	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Exh
nalysis date: 12/13/2016 17:24:17
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-3E02.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



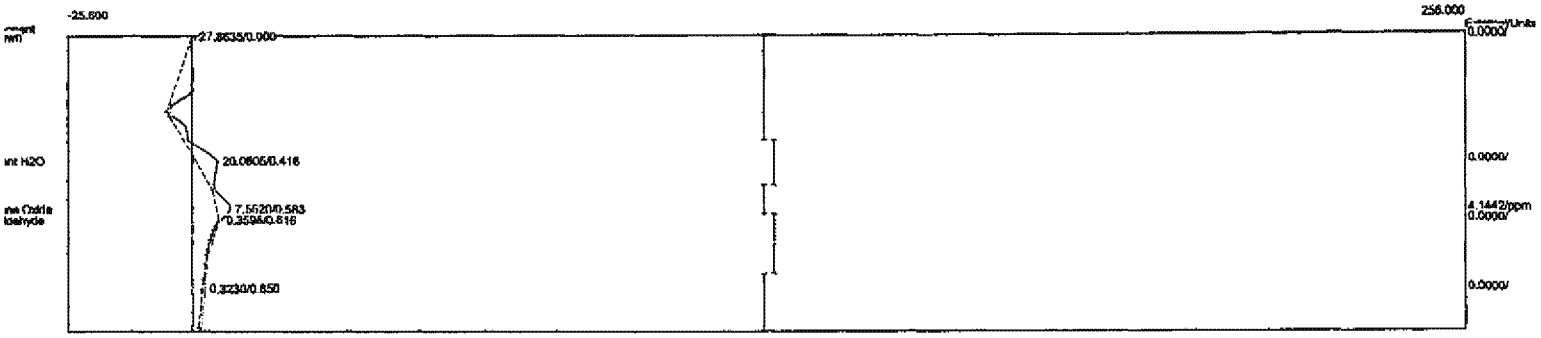
Component	Retention	Area	External	Units
ad Vol / Air	0.083	41.5045	0.0000	
ıbient H2O	0.433	22.7605	0.0000	
ıylene Oxide	0.583	8.9615	4.9176	ppm
etaldehyde	0.633	0.1935	0.0000	
)2	0.883	0.3810	0.0000	
		73.8010	4.9176	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Exh
nalysis date: 12/13/2016 17:25:30
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: eto2-100.cpt
Data file: 2Ster2WB2016-3E03.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



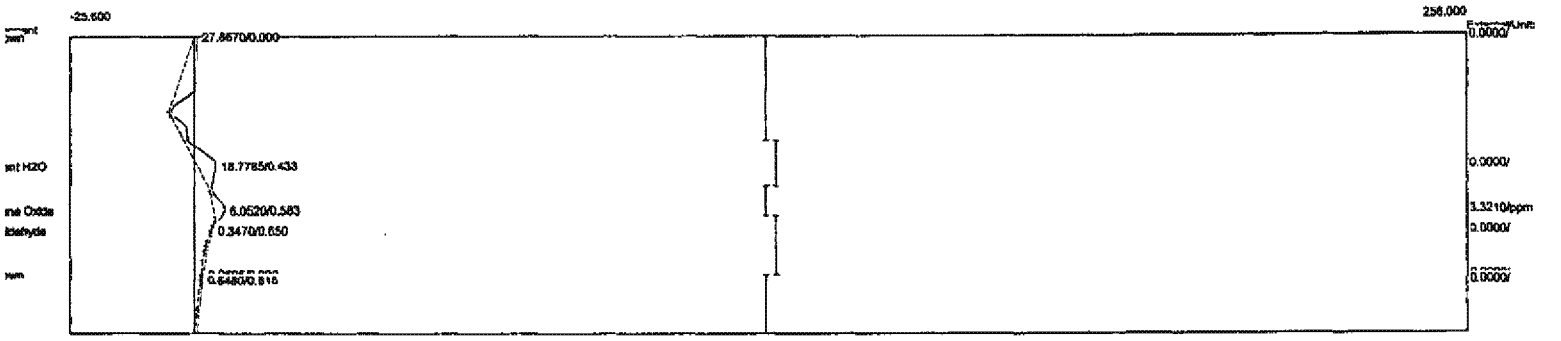
Component	Retention	Area	External	Units
ıbient H2O	0.416	20.3640	0.0000	
ıylene Oxide	0.566	10.6340	5.8354	ppm
ɜtaldehyde	0.783	0.4525	0.0000	
›2	0.883	0.2510	0.0000	
		31.7015	5.8354	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Exh
ıalysis date: 12/13/2016 17:26:47
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-3E04.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



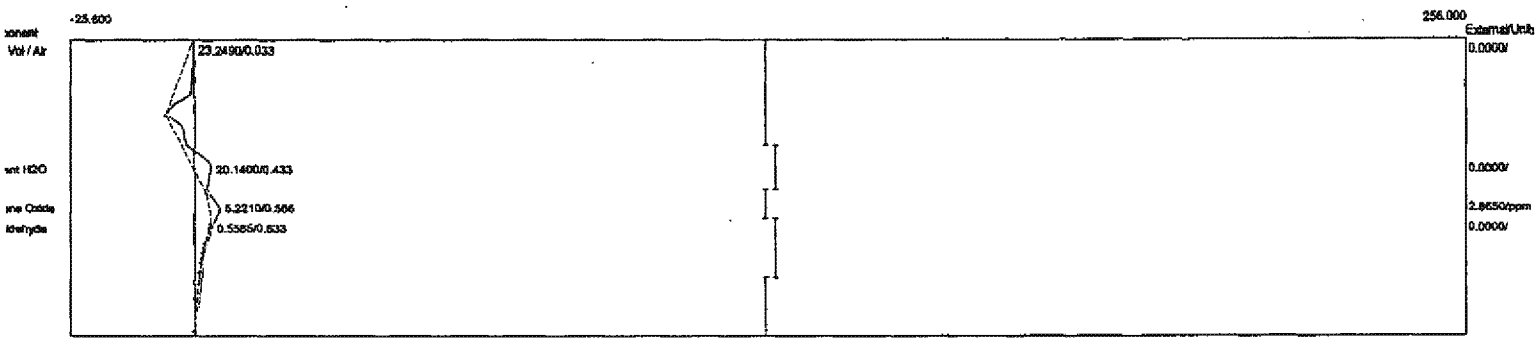
Component	Retention	Area	External	Units
bient H2O	0.416	20.0605	0.0000	
ylene Oxide	0.583	7.5520	4.1442	ppm
etaldehyde	0.616	0.3595	0.0000	
2	0.850	0.3230	0.0000	
		28.2950	4.1442	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Exh
nalysis date: 12/13/2016 17:28:00
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-3E05.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



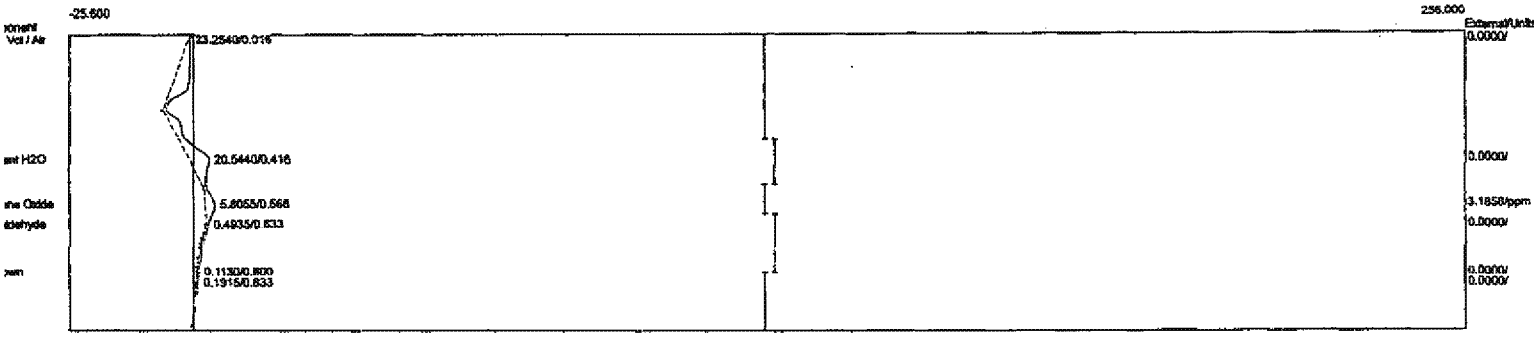
Component	Retention	Area	External	Units
ıbient H2O	0.433	18.7785	0.0000	
ıylene Oxide	0.583	6.0520	3.3210	ppm
ɜtaldehyde	0.650	0.3470	0.0000	
)2	0.816	0.6480	0.0000	
		25.8255	3.3210	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Exh
nalysis date: 12/13/2016 17:29:10
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-3E06.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.033	23.2490	0.0000	
ıbient H2O	0.433	20.1400	0.0000	
ıylene Oxide	0.566	5.2210	2.8650	ppm
etaldehyde	0.633	0.5585	0.0000	
		49.1685	2.8650	

Client: Sterigenics - Willowbrook 2
Client ID: Run#3Exh
ıalysis date: 12/13/2016 17:30:24
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: eto2-100.cpt
Data file: 2Ster2WB2016-3E07.CHR (c:\peak359)
Sample: AAT Safe Cell Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.016	23.2540	0.0000	
ıbient H2O	0.416	20.5440	0.0000	
ıylene Oxide	0.566	5.8055	3.1858	ppm
etaldehyde	0.633	0.4935	0.0000	
ı2	0.833	0.1915	0.0000	
		50.2885	3.1858	

APPENDIX H

Field Data and Calculation Worksheets

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Sterigenics, Inc. - Willowbrook, IL (Plant 2)
12/13/16 - Aeration Runs 1-3

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
	Run #1		
0.15	0.3873	74	0.01
0.15	0.3873	74	0.01
0.15	0.3873	74	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
	Run #2		
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	74	0.01
0.15	0.3873	74	0.01
0.15	0.3873	74	0.01
0.15	0.3873	74	0.01
0.15	0.3873	74	0.01
	Run #3		
0.15	0.3873	76	0.01
0.15	0.3873	76	0.01
0.15	0.3873	76	0.01
0.15	0.3873	76	0.01
0.15	0.3873	76	0.01
0.15	0.3873	76	0.01
0.15	0.3873	76	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
Average =			
0.15	0.3873	75.0	**0.0100**
	=	535	degR

mw =	28.51	
stack ID =	36	in.
stack area =	7.069	sq. ft.
press =	29.20	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	26.3	ft/sec
Flow =	**10412**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.000012**	**lbs/min**
EtO Mass Flow =	**0.000714**	**lbs/hr**

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Run #1 - Exhaust Phase - Chamber K
AAT Safe Cell System - Dry Bed Outlet
Sterigenics EO, Inc. - Willowbrook, IL (Plant 2)
December 13, 2016

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.15	0.3873	74	0.01
0.15	0.3873	74	0.01
0.15	0.3873	74	1.86
0.15	0.3873	75	2.45
0.15	0.3873	75	2.99
0.15	0.3873	75	1.61
0.15	0.3873	75	2.04
0.15	0.3873	75	1.65
0.15	0.3873	75	1.30
Average = 0.1500	0.3873	75	**1.547**
	=	535	degR

stack ID =	36	in.
stack area =	7.069	sq. ft.
press =	29.20	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	26.27	ft/sec
Flow =	**10415**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0018416**	**lbs/min**
evac start =	1249	
evac stop =	1301	
min/cycle =	12	
Outlet EtO Emissions =	**0.02210**	**lbs/cycle**

INLET CALCULATION:

Pre-Evac:				Post-Evac:			
	V =	1332	ft3		V =	1332	ft3
	P =	14.5	in Hg Abs		P =	3.0	in Hg Abs
	T =	125	degF		T =	125	degF
	R =	10.73			R =	10.73	
	mw =	44.05			mw =	44.05	
	lbs EtO @ 100% =	66.44	lbs		lbs EtO @ 100% =	13.75	lbs

Initial EtO = Scale Wt. =	60	lbs
% EtO @ Chamber = Scale Wt. / lbs EtO @ 100% (Pre) =	90.3	%
Final EtO = % EtO @ Chamber X lbs EtO @ 100% (Post) =	12.41	lbs
INLET ETO = Initial EtO - Final EtO =	**47.6**	**lbs**
Inlet EtO (from Aeration) =	2.215	lbs
TOTAL INLET ETO =	**49.801**	**lbs**
CONTROL EFFICIENCY =	**99.9556**	**%**

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Run #2 - Exhaust Phase - Chamber K
AAT Safe Cell System - Dry Bed Outlet
Sterigenics, Inc. - Willowbrook, IL (Plant 2)
December 13, 2016

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.15	0.3873	75	0.01
0.15	0.3873	75	0.01
0.15	0.3873	75	1.95
0.15	0.3873	75	3.41
0.15	0.3873	75	3.03
0.15	0.3873	75	3.25
0.15	0.3873	76	2.78
0.15	0.3873	75	1.82
0.15	0.3873	75	1.34
Average =			
0.1500	0.3873	75	**1.956**
	=	535	degR

stack ID =	36	in.
stack area =	7.069	sq. ft.
press =	29.20	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	26.28	ft/sec
Flow =	**10411**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0023275**	**lbs/min**
evac start =	1707	
evac stop =	1718	
min/cycle =	11	
Outlet EtO Emissions =	**0.02560**	**lbs/cycle**

INLET CALCULATION:

Pre-Evac:				Post-Evac:			
	V =	1332	ft3		V =	1332	ft3
	P =	14.5	in Hg Abs		P =	3.0	in Hg Abs
	T =	126	degF		T =	124	degF
	R =	10.73			R =	10.73	
	mw =	44.05			mw =	44.05	
	lbs EtO @ 100% =	66.33	lbs		lbs EtO @ 100% =	13.77	lbs

Initial EtO = Scale Wt. =	60	lbs
% EtO @ Chamber = Scale Wt. / lbs EtO @ 100% (Pre) =	90.5	%
Final EtO = % EtO @ Chamber X lbs EtO @ 100% (Post) =	12.46	lbs
INLET ETO = Initial EtO - Final EtO =	**47.5**	**lbs**
Inlet EtO (from Aeration) =	2.215	lbs
TOTAL INLET ETO =	**49.759**	**lbs**
CONTROL EFFICIENCY =	**99.9485**	**%**

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Run #3 - Exhaust Phase - Chamber G
AAT Safe Cell System - Dry Bed Outlet
Sterigenics, Inc. - Willowbrook, IL (Plant 2)
December 13, 2016

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.15	0.3873	75	0.47
0.15	0.3873	75	4.92
0.15	0.3873	75	5.84
0.15	0.3873	75	4.14
0.15	0.3873	75	3.32
0.15	0.3873	75	2.87
0.15	0.3873	76	3.19
Average =			
0.1500	0.3873	75	**3.536**
	=	535	degR

stack ID =	36	in.
stack area =	7.069	sq. ft.
press =	29.20	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	26.28	ft/sec
Flow =	**10411**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0042081**	**lbs/min**
evac start =	1722	
evac stop =	1731	
min/cycle =	9	
Outlet EtO Emissions =	**0.03787**	**lbs/cycle**

INLET CALCULATION:

Pre-Evac:				Post-Evac:			
	V =	1332	ft3		V =	1332	ft3
	P =	14.4	in Hg Abs		P =	3.0	in Hg Abs
	T =	125	degF		T =	125	degF
	R =	10.73			R =	10.73	
	mw =	44.05			mw =	44.05	
	lbs EtO @ 100% =	65.98	lbs		lbs EtO @ 100% =	13.75	lbs

Initial EtO = Scale Wt. =	59	lbs
% EtO @ Chamber = Scale Wt. / lbs EtO @ 100% (Pre) =	89.4	%
Final EtO = % EtO @ Chamber X lbs EtO @ 100% (Post) =	12.29	lbs
INLET ETO = Initial EtO - Final EtO =	**46.7**	**lbs**
Inlet EtO (from Aeration) =	2.215	lbs
TOTAL INLET ETO =	**48.923**	**lbs**
CONTROL EFFICIENCY =	**99.9226**	**%**

APPENDIX I

Gas Certifications

ECSi

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

300 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-001
Item No.: 02020001310TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CAL4448
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	1.10	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: MT

DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	1.	PPM	1.10	PPM	10.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1300 PSIG
Expiration Date: 18Apr2018

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

00 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-003
Item No.: 02020001320TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM003232
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	10.1	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: MT
MT

DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	10.	PPM	10.1	PPM	1.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1400 PSIG
Expiration Date: 18Apr2018

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

500 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-004
Item No.: 02020001330TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM011385
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	100.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully BLM DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	100.	PPM	100.	PPM	.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1400 PSIG
Expiration Date: 18Apr2018

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

500 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-005
Item No.: 02020001340TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM002810
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	1,000.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully
BLM

DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	1,000.	PPM	1,000.	PPM	.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1300 PSIG
Expiration Date: 18Apr2018

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

500 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-006
Item No.: 02020001340TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM005787
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	10,080.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully
BLM

DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	10,000.	PPM	10,080.	PPM	.8	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 800 PSIG
Expiration Date: 18Apr2018

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFICATE OF ANALYSIS

Customer Name:	ECSi, Inc.	**Cylinder Number:**	SA25925
Stock or Analyzer Tag Number:	N/A	**Product Class:**	Certified Standard
Customer Reference:	Verbal- Dan	**Cylinder - Contents[1]:**	28 CF @ 2000 PSI
MESA Reference:	104448	**Cylinder-CGA:**	A006-HP-BR/350
Date of Certification:	4/20/2016	**Analysis Method:**	GC-TCD/FID
Recommended Shelf Life:	2 Years	**Preparation Method:**	Gravimetric

Component	Requested Concentration[2]	Reported Concentration[2,3]
Ethylene Oxide	50 ppm	48.8 ppm
Nitrogen	Balance	Balance

Authorized Signature:

1. The fill pressure shown on the COA is as originally quoted. The fill pressure measured by the customer may differ from the fill pressure originally quoted due to temperature effects, compressibility of the individual components when blended together in the cylinder, gauge accuracy or reduction in content volume before shipping as a result of samples withdrawn for laboratory QC necessary to ensure product quality.
2. Unless otherwise stated, concentrations are given in molar units.
3. Vapor pressure mixes are blended at a sufficiently low pressure so as to eliminate phase separation under most low temperature conditions encountered during transport or storage. However, it is generally recommended that cylinders containing vapor pressure restricted mixes be placed on the floor in a horizontal position and rolled back and forth to improve homogeneity of the gas phase mixture before being put into service.

Analytical Gas Standards are prepared and analyzed using combinations of NIST traceable weights, SRM's provided by NIST, or internal gas standards that have been verified for accuracy using procedures published by the US-EPA. Pure gases are analyzed and certified for purity using minor component Analytical Gas Standards prepared according to the methods specified above. Balances are calibrated to NIST test weights covered by NIST test number 822/256175/96. Reference Certification #'s: 163/W, 830/N and 3280. Calibration methods are in conformance with MIL-STD 45662A.

MESA Specialty Gases & Equipment
division of MESA International Technologies, Inc.
3619 Pendleton Avenue, Suite C ♦ Santa Ana, California 92704 ♦ USA
TEL: 714-434-7102 ♦ FAX: 714-434-8006 ♦ E-mail: mail@mesagas.com
On-line Catalog at www.mesagas.com

APPENDIX J

Process Data

Process Run Record

Sterigenics International, Inc.
7775 S. Quincy Street
Willowbrook, IL 60527
Tel: +1 (630) 654-5151

Run ID:	**304145**	Pallet Count:	**0**	Equipment:	**Chamber G**
Customer:	**Sterigenics International**			Workorder Num:	**1860461**
Specification:	**17.1**	Checksum:	**-24959**	Cycle:	**Antares Cycle 751/CV 22130**
Description:	**ENG #9-12DEC2016**				
Date Started:	**13-Dec-16 21:38:07**			Date Completed:	
Date Aborted:	**13-Dec-16 23:22:04**	**Aborted!**		Aborted By:	**Ray Cruz**
Additional Info:	**TEST**				

1. Phase » General Configuration

(Phase No.0)

Date / Time	
13-Dec-16	
21:38:07	
SYS	Run ID 304145 has started

2. Phase » Start-up Phase

(Phase No.1)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure
13-Dec-16		
21:38:08	122.5	29.4
21:39:28	123.0	29.3
21:39:33	123.1	29.3

3. Phase » Vacuum

(Phase No.2)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure
13-Dec-16		
21:39:33	123.1	29.3
21:40:34	123.4	26.6
21:41:34	123.8	24.6
21:42:34	124.1	22.6
21:43:34	124.3	20.4
21:44:34	124.5	18.2
21:45:34	124.7	16.3
21:46:34	124.9	14.5
21:47:34	125.1	12.7
21:48:34	125.3	11.0
21:49:34	125.4	9.3
21:50:34	125.5	7.5
21:51:34	125.6	6.0

...

9. Phase » EO Inject by Pressure

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure	[mg/l] AT-EO	[lbs] EO Weight Used
13-Dec-16				
23:05:25	125.0	7.3	277.6	25
23:06:25	125.1	8.4	342.1	30
23:07:25	125.1	9.4	409.3	35
23:08:25	125.2	10.4	471.2	40
23:09:25	125.3	11.4	533.3	45
23:10:25	125.3	12.4	596.5	49
23:11:25	125.4	13.4	660.1	54
23:12:25	125.5	14.4	724.0	59
23:12:25	125.5	14.4	724.7	59
23:12:30	125.5	14.5	732.8	59

Step Gas Usage

ID	Gas	Drum S/N	Lot Number	Usage Value
513	EO	E000230	UTLX902730L16	59lbs

Device	Summary	Summary Value		Specified Range
Current Phase Time	Final	00:12:06		00:06:27 - 00:25:48
Elapsed Phase Time	Final	00:12:06		n/a - N/A
TempAve	Min	124.7	°F	120.0 - 130.0 °F
TempAve	Max	125.5	°F	120.0 - 130.0 °F
PCurr	Final	14.5	inHg	13.9 - 15.9 inHg
PCurr	Final	14.5	inHg	n/a - 14.9 inHg
AT-EO	Final	732.8	mg/l	N/A - N/A mg/l
EO Weight Used	Final	59	lbs	N/A - N/A lbs

10. Phase » EO Dwell

(Phase No.7)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure	[mg/l] AT-EO	[lbs] EO Weight Used	[mg/l] AT-AH	[%] RH Sensor
13-Dec-16						
23:12:30	125.5	14.5	733.2	0	15.1	N/A
23:13:31	125.5	14.4	768.6	0	15.6	N/A
23:14:31	125.5	14.4	770.8	0	15.1	N/A
23:15:31	125.5	14.4	772.9	0	16.0	N/A
23:16:31	125.5	14.4	773.2	0	15.6	N/A
23:17:31	125.5	14.4	773.1	0	16.0	N/A
23:18:31	125.5	14.4	773.2	0	16.5	N/A
23:19:31	125.5	14.4	773.1	0	16.5	N/A
23:20:31	125.4	14.4	773.1	0	16.3	N/A
23:21:31	125.3	14.4	773.1	0	16.9	N/A
23:22:04	125.3	14.4	775.4	0	16.5	N/A
OPR Operator has requested abort						
23:22:04	125.3	14.4	775.4	0	16.5	N/A
DVN Current Phase Time has a measurement value of 00:09:34. The min specified value is 00:59:00						

...

10. Phase » EO Dwell

Device	Summary	Summary Value		Specified Range
Current Phase Time	Final	00:09:34		00:59:00 - 05:00:00
Elapsed Phase Time	Final	00:09:34		n/a - N/A
TempAve	Min	125.3	°F	120.0 - 130.0 °F
TempAve	Max	125.5	°F	120.0 - 130.0 °F
PCurr	Min	14.4	inHg	14.0 - 16.0 inHg
PCurr	Min	14.4	inHg	n/a - 14.9 inHg
PCurr	Max	14.5	inHg	14.0 - 16.0 inHg
PCurr	Max	14.5	inHg	n/a - 14.9 inHg
RH from AH Calc	Min	N/A	%	N/A - N/A %
RH from AH Calc	Max	N/A	%	N/A - N/A %
AT-AH	Min	15.1	mg/l	N/A - N/A mg/l
AT-AH	Max	16.9	mg/l	N/A - N/A mg/l
AT-EO	Min	733.2	mg/l	N/A - N/A mg/l
AT-EO	Max	775.4	mg/l	N/A - N/A mg/l
EO Weight Used	Final	0	lbs	N/A - N/A lbs

DVN Current Phase Time has a measurement value of 00:09:34. The min specified value is 00:59:00

11. Phase » Vacuum

(Phase No.8)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure
13-Dec-16		
23:22:04	125.3	14.4
SYS Cycle has entered EO-Abort sequence while running Run ID 304145 at phase no. 8 - 0		
23:23:05	125.3	12.3
23:24:05	125.2	10.7
23:25:05	125.2	8.9
23:26:05	125.0	7.4
23:27:05	125.0	6.1
23:28:05	124.8	5.1
23:29:05	124.8	4.3
23:30:05	124.8	3.6
23:31:05	124.8	3.1
23:31:12	124.7	3.0
23:31:14	124.7	3.0

Device	Summary	Summary Value		Specified Range
Current Phase Time	Final	00:09:10		00:02:51 - 00:20:00
Elapsed Phase Time	Final	00:09:10		n/a - N/A
TempAve	Min	124.7	°F	120.0 - 130.0 °F
TempAve	Max	125.3	°F	120.0 - 130.0 °F
PCurr	Final	3.0	inHg	2.5 - 3.5 inHg
PCurr	Final	3.0	inHg	n/a - N/A inHg

12. Phase » Nitrogen Inject

(Phase No.9 - 1)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure	[mg/l] AT-EO

...

9. Phase » EO Inject by Pressure

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure	[mg/l] AT-EO	[lbs] EO Weight Used
13-Dec-16				
22:54:25	125.3	3.5	30.1	8
22:55:25	125.4	4.3	58.2	11
22:56:25	125.4	5.3	110.3	16
22:57:25	125.4	6.3	167.8	21
22:58:25	125.4	7.2	223.4	25
22:59:25	125.5	8.3	286.5	30
23:00:25	125.5	9.3	347.5	35
23:01:25	125.5	10.3	404.4	40
23:02:25	125.5	11.3	457.8	45
23:03:25	125.5	12.3	519.3	50
23:04:25	125.5	13.3	579.4	54
23:05:25	125.5	14.3	639.9	59
23:05:29	125.6	14.4	646.1	60
23:05:34	125.6	14.5	655.8	60

Step Gas Usage

ID	Gas	Drum S/N	Lot Number	Usage Value
511	EO	E001214	UTLX902730L16	60lbs

Device	Summary	Summary Value		Specified Range
Current Phase Time	Final	00:12:10		00:06:27 - 00:25:48
Elapsed Phase Time	Final	00:12:10		n/a - N/A
TempAve	Min	125.3	°F	120.0 - 130.0 °F
TempAve	Max	125.6	°F	120.0 - 130.0 °F
PCurr	Final	14.5	inHg	13.9 - 15.9 inHg
PCurr	Final	14.5	inHg	n/a - 14.9 inHg
AT-EO	Final	655.8	mg/l	N/A - N/A mg/l
EO Weight Used	Final	60	lbs	N/A - N/A lbs

10. Phase » EO Dwell

(Phase No.7)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure	[mg/l] AT-EO	[lbs] EO Weight Used	[mg/l] AT-AH	[%] RH Sensor
13-Dec-16						
23:05:34	125.6	14.6	656.3	0	N/A	N/A
23:06:35	125.6	14.5	672.9	0	N/A	N/A
23:06:50	125.5	14.5	672.9	0	N/A	N/A
OPR Operator has requested abort						
23:06:50	125.5	14.5	672.9	0	N/A	N/A
DVN Current Phase.Time has a measurement value of 00:01:16. The min specified value is 00:59:00						

Process Run Record

Sterigenics International, Inc.
7775 S. Quincy Street
Willowbrook, IL 60527
Tel: +1 (630) 654-5151

Run ID:	**304146**	Pallet Count:	**0**	Equipment:	**Chamber K**
Customer:	**Sterigenics International**			Workorder Num:	**1860463**
Specification:	**17.1**	Checksum:	**-24959**	Cycle:	**Antares Cycle 751/CV 22130**
Description:	**ENG #10 12DEC16**				
Date Started:	**13-Dec-16 21:25:41**			Date Completed:	
Date Aborted:	**13-Dec-16 23:06:50**	**Aborted!**		Aborted By:	**Ray Cruz**

1. Phase » General Configuration

(Phase No.0)

Date / Time	
13-Dec-16	
21:25:41	
SYSMI	Run ID 304146 has started

2. Phase » Start-up Phase

(Phase No.1)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure
13-Dec-16		
21:25:41	123.7	29.9
21:25:42	123.7	29.9
21:25:46	123.7	29.9

3. Phase » Vacuum

(Phase No.2)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure
13-Dec-16		
21:25:46	123.7	29.9
21:26:47	123.6	27.0
21:27:47	123.5	24.8
21:28:47	123.4	23.1
21:29:47	123.4	21.4
21:30:47	123.4	19.6
21:31:47	123.3	17.6
21:32:47	123.3	15.7
21:33:47	123.3	13.8
21:34:47	123.2	11.8
21:35:47	123.2	10.1
21:36:47	123.2	8.4
21:37:47	123.2	7.0
21:38:47	123.2	5.9
21:39:47	123.2	5.0

...

10. Phase » EO Dwell

Device	Summary	Summary Value		Specified Range
Current Phase Time	Final	00:01:16		00:59:00 - 05:00:00
Elapsed Phase Time	Final	00:01:17		n/a - N/A
TempAve	Min	125.5	°F	120.0 - 130.0 °F
TempAve	Max	125.6	°F	120.0 - 130.0 °F
PCurr	Min	14.5	inHg	14.0 - 16.0 inHg
PCurr	Min	14.5	inHg	n/a - 14.9 inHg
PCurr	Max	14.6	inHg	14.0 - 16.0 inHg
PCurr	Max	14.6	inHg	n/a - 14.9 inHg
RH from AH Calc	Min	N/A	%	N/A - N/A %
RH from AH Calc	Max	N/A	%	N/A - N/A %
AT-AH	Min	N/A	mg/l	N/A - N/A mg/l
AT-AH	Max	N/A	mg/l	N/A - N/A mg/l
AT-EO	Min	656.3	mg/l	N/A - N/A mg/l
AT-EO	Max	672.9	mg/l	N/A - N/A mg/l
EO Weight Used	Final	0	lbs	N/A - N/A lbs

DVN Current Phase Time has a measurement value of 00:01:16. The min specified value is 00:59:00

11. Phase » Vacuum

(Phase No.8)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure
13-Dec-16		
23:06:50	125.5	14.5
SYS Cycle has entered EO-Abort sequence while running Run ID 304146 at phase no. 8 - 0		
23:07:51	125.4	12.7
23:08:51	125.3	11.0
23:09:51	125.2	9.4
23:10:51	125.0	8.1
23:11:51	124.9	7.0
23:12:51	124.8	6.0
23:13:51	124.7	5.2
23:14:51	124.6	4.5
23:15:51	124.5	3.9
23:16:51	124.5	3.4
23:17:50	124.4	3.0
23:17:51	124.4	3.0
23:17:52	124.4	3.0

Device	Summary	Summary Value		Specified Range
Current Phase Time	Final	00:11:02		00:02:51 - 00:20:00
Elapsed Phase Time	Final	00:11:02		n/a - N/A
TempAve	Min	124.4	°F	120.0 - 130.0 °F
TempAve	Max	125.5	°F	120.0 - 130.0 °F
PCurr	Final	3.0	inHg	2.5 - 3.5 inHg
PCurr	Final	3.0	inHg	n/a - N/A inHg

12. Phase » Nitrogen Inject

(Phase No.9 - 1)

Process Run Record

Sterigenics International, Inc.
7775 S. Quincy Street
Willowbrook, IL 60527
Tel: +1 (630) 654-5151

Run ID:	**304143**	Pallet Count:	**0**	Equipment:	**Chamber K**
Customer:	**Sterigenics International**			Workorder Num:	**1860458**
Specification:	**17.1**	Checksum:	**-24959**	Cycle:	**Antares Cycle 751/CV 22130**
Description:	**ENG #8-12DEC2016**				
Date Started:	**13-Dec-16 12:43:04**			Date Completed:	
Date Aborted:	**13-Dec-16 18:49:43**	**Aborted!**		Aborted By:	**Ray Cruz**
Additional Info:	**EPA TEST**				

1. Phase » General Configuration

(Phase No.0)

Date / Time
13-Dec-16
12:43:04

2. Phase » Start-up Phase

(Phase No.1)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure
13-Dec-16		
12:43:05	124.9	29.9
12:43:09	124.9	29.9

3. Phase » Vacuum

(Phase No.2)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure
13-Dec-16		
12:43:09	124.9	29.9
12:44:10	124.8	27.0
12:45:10	124.6	24.8
12:46:10	124.5	23.2
12:47:10	124.4	21.5
12:48:10	124.4	19.6
12:49:10	124.3	17.7
12:50:10	124.2	15.7
12:51:10	124.1	13.8
12:52:10	124.0	11.8
12:53:10	124.0	10.0
12:54:10	123.9	8.4
12:55:10	123.9	7.0
12:56:10	123.9	5.9
12:57:10	123.9	5.0

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9. Phase » EO Inject by Pressure

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure	[mg/l] AT-EO	[lbs] EO Weight Used
13-Dec-16				
14:11:42	126.1	3.5	27.1	8
14:12:42	126.1	4.3	56.4	12
14:13:42	126.1	5.3	110.0	17
14:14:42	126.2	6.3	164.4	21
14:15:42	126.1	7.3	231.6	26
14:16:42	126.1	8.3	288.4	31
14:17:42	126.1	9.3	350.4	36
14:18:42	126.2	10.3	404.4	40
14:19:42	126.2	11.3	463.3	45
14:20:42	126.2	12.3	522.3	49
14:21:42	126.2	13.3	584.0	54
14:22:42	126.2	14.3	645.1	59
14:22:46	126.2	14.4	650.1	59
14:22:51	126.2	14.6	661.5	60

Step Gas Usage

ID	Gas	Drum S/N	Lot Number	Usage Value
511	EO	E001214	UTLX902730L16	60lbs

Device	Summary	Summary Value		Specified Range
Current Phase Time	Final	00:12:10		00:06:27 - 00:25:48
Elapsed Phase Time	Final	00:12:10		n/a - N/A
TempAve	Min	126.1	°F	120.0 - 130.0 °F
TempAve	Max	126.2	°F	120.0 - 130.0 °F
PCurr	Final	14.6	inHg	13.9 - 15.9 inHg
PCurr	Final	14.6	inHg	n/a - 14.9 inHg
AT-EO	Final	661.5	mg/l	N/A - N/A mg/l
EO Weight Used	Final	60	lbs	N/A - N/A lbs

10. Phase » EO Dwell

(Phase No.7)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure	[mg/l] AT-EO	[lbs] EO Weight Used	[mg/l] AT-AH	[%] RH Sensor
13-Dec-16						
14:22:51	126.2	14.6	661.6	0	N/A	N/A
14:23:16	126.2	14.5	672.9	0	N/A	N/A
SYS Chamber was placed in hold mode while running Run ID 304143 at phase no. 7 - 0						
OPR Operator has requested hold mode						
14:23:52	126.1	14.5	676.9	0	N/A	N/A
14:24:52	126.1	14.5	672.9	0	N/A	N/A
14:25:52	126.0	14.4	673.0	0	N/A	N/A
14:26:52	126.0	14.4	672.9	0	N/A	N/A
14:27:52	125.9	14.4	673.9	0	N/A	N/A
14:28:52	125.9	14.4	684.4	0	N/A	N/A
14:29:52	125.8	14.4	672.9	0	N/A	N/A
14:30:52	125.7	14.4	673.0	0	N/A	N/A

...

10. Phase » EO Dwell

Device	Summary	Summary Value		Specified Range
Current Phase Time	Final	04:26:52		00:59:00 - 05:00:00
Elapsed Phase Time	Final	04:26:53		n/a - N/A
TempAve	Min	124.1	°F	120.0 - 130.0 °F
TempAve	Max	126.2	°F	120.0 - 130.0 °F
PCurr	Min	14.4	inHg	14.0 - 16.0 inHg
PCurr	Min	14.4	inHg	n/a - 14.9 inHg
PCurr	Max	14.6	inHg	14.0 - 16.0 inHg
PCurr	Max	14.6	inHg	n/a - 14.9 inHg
RH from AH Calc	Min	N/A	%	N/A - N/A %
RH from AH Calc	Max	N/A	%	N/A - N/A %
AT-AH	Min	N/A	mg/l	N/A - N/A mg/l
AT-AH	Max	N/A	mg/l	N/A - N/A mg/l
AT-EO	Min	661.6	mg/l	N/A - N/A mg/l
AT-EO	Max	684.5	mg/l	N/A - N/A mg/l
EO Weight Used	Final	0	lbs	N/A - N/A lbs

11. Phase » Vacuum

(Phase No.8)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure
13-Dec-16		
18:49:43	124.5	14.5
SYS Cycle has entered EO-Abort sequence while running Run ID 304143 at phase no. 8 - 0		
18:50:44	124.5	12.7
18:51:44	124.5	11.0
18:52:44	124.5	9.4
18:53:44	124.4	8.1
18:54:44	124.3	6.9
18:55:44	124.3	6.0
18:56:44	124.4	5.2
18:57:44	124.4	4.5
18:58:44	124.4	3.9
18:59:44	124.5	3.4
19:00:41	124.5	3.0
19:00:42	124.5	3.0

Device	Summary	Summary Value		Specified Range
Current Phase Time	Final	00:10:59		00:02:51 - 00:20:00
Elapsed Phase Time	Final	00:10:59		n/a - N/A
TempAve	Min	124.3	°F	120.0 - 130.0 °F
TempAve	Max	124.5	°F	120.0 - 130.0 °F
PCurr	Final	3.0	inHg	2.5 - 3.5 inHg
PCurr	Final	3.0	inHg	n/a - N/A inHg

12. Phase » Nitrogen Inject

(Phase No.9 - 1)

Date / Time	[°F] Avg. Chamber Gas Temp	[inHg] Current Pressure	[mg/l] AT-EO

Report Summary

Total number of steps: **13**

Gas Usage Summary

Gas	Usage Value
EO	60 lbs

Deviations

Total Number of deviations: 0

All dates are expressed in the timezone: (UTC) Coordinated Universal Time

STERIGENICS
7775 S QUINCY ST
WILLOWBROOK, IL 60527
1-630-654-5151
CHAMBER NO.2

JC 12DEC16

DATE	12/12/16 Mon	CYCLE 751		STERILANT	EO
PROG VERSION	KORSCP V3Q-4			CHECK VALUE	22130
RUN NUMBER	1860427			OPERATOR	R CASTELLANO

12D3014

CUSTOMER	MAINTENANCE
LOT NO.	ENG #1-12DEC2016
QUANTITY	NA
PRODUCT	NA

IRRENT TANK: LOT # E001579UTLX902730L16, TARE 266.0 LB
:ALE WEIGHT 355.0 LB, STERILANT LEFT 84.0 LB

PROCESS PARAMETERS

CHAMBER TEMP	125 F, COOL AT 135 F, BLOWER IS USED, ALARM REPETITION 15:00 MM:SS
VACUUM A	2.0 INHGA, 2.01 INHG/MIN, REQD 3.0 INHGA
LEAK TEST	0:05 HH:MM, TOLERANCE 0.2 INHG
NITROGEN DILUTION	2 CYCLES; NITROGEN: 24.0 INHGA, 1.51 INHG/MIN EVAC: 2.0 INHGA, 2.01 INHG/MIN
GAS A	1 CYCLES; INJ: 14.4 INHGA, 1.00 INHG/MIN, EO
GAS DWELL	14.4 INHGA, -0.2 INHG, DWELL 1:00 HH:MM
AFTER VACUUM	3.0 INHGA OR 0:45 HH:MM, 2.01 INHG/MIN, REQD 3.5 INHGA
GAS WASH A	3 CYCLES RLS: 23.0 INHGA, 1.51 INHG/MIN, NITR VAC: 3.0 INHGA OR 0:45 HH:MM, 2.01 INHG/MIN REQD 3.5 INHGA
GAS WASH B	1 CYCLES RLS: 23.0 INHGA, 1.51 INHG/MIN, AIR VAC: 3.0 INHGA OR 0:45 HH:MM, 2.01 INHG/MIN REQD 3.5 INHGA
RELEASE	28.0 INHGA, 1.51 INHG/MIN

TIME	PRESS INHGA	TEMP (DEG F) AVG	RH %	VAP ETO GAS MG/L	H2O MG/L	ALARMS & MESSAGES	ACTION TAKEN
5:31	OPERATOR SENSOR CHECK --		PR	99.8,	RH	121,	JWT 128, VLT 81, VGX 107
	CT1	124, CT2	122,	CT3	124,	P01 122,	P02 80, P03 80, P04 80
	P05	80, P06	80,	P07	80,	P08 80,	P09 80, P10 80, P11 80
	P12	80, P13	80,	P14	80,	P15 80,	P16 80, P17 80, P18 80
	P19	80, P20	80,	ETO	0,	H2O 14.0,	WT 355.0
5:45	OPERATOR SENSOR CHECK --		PR	99.8,	RH	121,	JWT 131, VLT 81, VGX 107
	CT1	124, CT2	121,	CT3	123,	P01 122,	P02 81, P03 81, P04 81
	P05	81, P06	81,	P07	81,	P08 81,	P09 81, P10 81, P11 81
	P12	81, P13	81,	P14	81,	P15 81,	P16 81, P17 81, P18 81
	P19	81, P20	81,	ETO	0,	H2O 15.7,	WT 355.0
6:14	OPERATOR SENSOR CHECK --		PR	99.8,	RH	121,	JWT 132, VLT 81, VGX 109
	CT1	127, CT2	123,	CT3	126,	P01 124,	P02 81, P03 81, P04 81
	P05	81, P06	81,	P07	81,	P08 81,	P09 81, P10 81, P11 81
	P12	81, P13	81,	P14	81,	P15 81,	P16 81, P17 81, P18 81
	P19	81, P20	81,	ETO	0,	H2O 19.9,	WT 354.9

Message

From: Bollweg, George [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1592106E02634BB2BDA8CC788B125F2C-GBOLLWEG]
Sent: 12/20/2017 9:26:56 PM
To: Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
Subject: RE: Ele and Sterigenics letters
Attachments: 2017Dec20SterigenicsDraftLetter,GBSuggestions.doc

Some suggestions in case there's still time to comment on the Sterigenics letter (attached)

From: Sieffert, Margaret
Sent: Wednesday, December 20, 2017 1:48 PM
To: Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Bollweg, George <bollweg.george@epa.gov>
Subject: RE: Ele and Sterigenics letters

OK I will leave the formatting to Angeline. Here are the revised versions.

-Margaret

From: Cain, Alexis
Sent: Wednesday, December 20, 2017 1:33 PM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Bollweg, George <bollweg.george@epa.gov>
Subject: RE: Ele and Sterigenics letters

I think that this looks good Margaret. Some minor edits attached on the Ele letter—I would have the equivalent edits on the Sterigenics letter. I don't think Peggy is usually in the review chain for letters like this (not controls). Of course, I don't object if she wants to review. Angeline should review for format, and she can print once we have concurrence through Katie.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Sieffert, Margaret
Sent: Wednesday, December 20, 2017 1:07 PM
To: Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Bollweg, George <bollweg.george@epa.gov>
Subject: Ele and Sterigenics letters

Here are my draft letters. **Deliberative Process / Ex. 5**

Deliberative Process / Ex. 5

Margaret

Message

From: Nwia, Jacqueline [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D299B56BD7EF46709FB7465FD1E15466-JNWIA]
Sent: 6/20/2018 9:57:37 PM
To: Kelley, Jeff [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e154fa5a5f744c70aa3da58e3f87aabe-JKelley]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Singer, Joshua [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f29c3a13f65447ae887edd3bdc89d77a-JSinge02]; Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]
Subject: RE: Draft internal talking points

Suggested revisions in red, blue and strikeout.

From: Kelley, Jeff
Sent: Wednesday, June 20, 2018 3:48 PM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>; Singer, Joshua <Singer.Joshua@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: Fwd: Draft internal talking points

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

Begin forwarded message:

> **From:** "Sanders, Amy" <Sanders.Amy@epa.gov>
> **Date:** June 20, 2018 at 3:39:40 PM CDT
> **To:** "Kelley, Jeff" <kelley.jeff@epa.gov>
> **Cc:** "Newton, Cheryl" <Newton.Cheryl@epa.gov>, "Short, Thomas" <short.thomas@epa.gov>, "Payne, James" <payne.james@epa.gov>, "Thiede, Kurt" <thiede.kurt@epa.gov>
> **Subject: Draft internal talking points**
>
> Jeff—Here is the draft Cheryl and I worked on (main credit to Cheryl—her ARD background was handy ☺). It's ready for you to edit to ensure consistency. In speaking to Tom, there is some concern that many employees may (or may not) be on site Thursday/Friday of this week, which may result in this meeting needing to be telephonic too.
>
> **Internal talking points:**

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thanks,

Amy Sanders
Human Capital Officer
U.S. EPA, Region 5
Resources Management Division
77 W Jackson Blvd
Chicago, IL 60604
Email: sanders.amy@epa.gov
Office: (312) 353-9196

Message

From: Nwia, Jacqueline [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D299B56BD7EF46709FB7465FD1E15466-JNWIA]
Sent: 6/20/2018 9:31:22 PM
To: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
CC: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]
Subject: Map or No Map

Karen Reskin reached out to Ed about working together to put a map together for Sterigenics. Since they'll be making one, it didn't make sense for me to make one as well. Let me know otherwise.

Jackie

Jacqueline Nwia
Environmental Scientist
Air Monitoring and Analysis Section
Air Toxics and Assessment Branch
Air and Radiation Division
U.S. Environmental Protection Agency, Region 5
77 West Jackson Blvd. (AR-18)
Chicago, IL 60604
ph. (312) 886-6081
nwia.jacqueline@epa.gov

Message

From: Nam, Ed [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A2653F1DDD59470688BA557DD84D9690-NAM, ED]
Sent: 9/28/2018 10:03:07 PM
To: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: FW: Stack Testing and Model Parameters

FYI

From: Koerber, Mike
Sent: Friday, September 28, 2018 4:56 PM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Rimer, Kelly <Rimer.Kelly@epa.gov>
Subject: Re: Stack Testing and Model Parameters

Thanks, Ed. Good to see you today. Yes, Bill has asked us to do this. Kelly and her team will coordinate with R5, as appropriate.

Mike

Sent from my iPhone

On Sep 28, 2018, at 4:24 PM, Nam, Ed <nam.ed@epa.gov> wrote:

> Mike,
>
> Please see message from Kathy below. Are you now the Point of contact for Kathy Hoffman on questions and issues? If so, I have been in communication with her about getting modeling parameters. They have been delaying getting us this simple information for weeks. Please let me know if you'd like me to back down.
>
> Thanks
> -Ed
>
> ---
>
> **From:** Hoffman, Kathy [mailto:KHoffman@sterigenics.com]
> **Sent:** Friday, September 28, 2018 2:30 PM
> **To:** Nam, Ed <nam.ed@epa.gov>
> **Cc:** Siegel, Kathryn <siegel.kathryn@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Armitage, Julie <Julie.Armitage@Illinois.gov>
> **Subject:** RE: Stack Testing and Model Parameters
>
> Ed:
>
> I forwarded you the stack test results yesterday.
>
> As for the modelling parameters and other questions, I was told to work with Mike Koerber from EPA OAQPS on the current and future modelling for the Willowbrook facility. We are planning to provide this information to him early next week. To ensure accuracy and consistency, I think it is best to work with one US EPA contact for this information.

Let me know if you have any questions on this or want to discuss further.

Regards,
Kathy

Kathleen Hoffman
Senior Vice President - Global Environmental, Health & Safety and Technical Services
Sterigenics, A Sotera Health Company
2015 Spring Road, Suite 650
Oak Brook, IL 60523
Office: 630.928.1758
khoffman@sterigenics.com

From: Nam, Ed [mailto:nam.ed@epa.gov]
Sent: Thursday, September 27, 2018 11:45 AM
To: Hoffman, Kathy
Cc: Siegel, Kathryn; Cain, Alexis; Armitage, Julie
Subject: Stack Testing and Model Parameters

Hello Kathy,

I was glad to hear that your stack test was completed last week, and we look forward to seeing the results. We would like to make sure that as soon as the results are available, we are able to describe the results to the public. This will mean modeling risk based on a new emissions estimate; therefore, I would like to reiterate that it is imperative that you provide the modeling parameters that we requested, mostly recently in the September 7, 2018 email to you from Alexis Cain.

Even prior to us being able to release modeling information, we will need to describe what the stack tests show about how much emissions have decreased as a result of the back vent controls. Therefore, please provide us, along with the draft stack test results, as soon as they are available, with an estimate of annual stack and fugitive emissions, along with an estimate of the reductions achieved as a result of the back vent project. I also ask that you provide all of your calculations and a description of your estimation method. This will help us both being able to describe to the public the emissions impact of the back vent project and with being able to model revised emissions as soon as possible.

Thank you, and please let me know if you would like to discuss this request.

-Ed

-Edward Nam
Director, Air and Radiation Division
US EPA, Region 5, Mail code A-18J
77 W. Jackson Blvd.
Chicago, IL 60604-3590
Phone 312-353-2192 nam.ed@epa.gov

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The content image001.jpg of type has been blocked.

Willowbrook 1

Building height towards front		about 23 feet
Building height towards back		about 25.5 feet
Map Reference	Description	Lattitude
1	Deoxx	41.748281
2	AAT Scrubber	41.748354
3	Backvents	41.748253
4	NW Building Corner	41.748264
5	W Building Corner	41.748139
6	W Building Corner	41.747923
7	SW Building Corner	41.747805
8	SE Building Corner	41.747841
9	NE Building Corner	41.748331
10	OFFICE AC UNITS	
11	4 ' EXHAUST FANS	
12	WORK AISLE EXHAUST FAN	
13	AERATION EXHAUST HOODS NOT IN SERVICE	
14	BATTERY CHARGING EXHAUST	
15	CHILLER	
16	OLD CHILLER NOT IN SERVICE	
17	PROCESS STORAGE MAKE UP AIRS	
18	AERATION MAKE UP AIR UNIT	
19	EAST AERATION MAKE UP AIR UNITS NOT IN SERVICE	
20	WORK AISLE MAKE UP AIR	
21	CHAMBER E CUBICAL EXHAUST	

Longitude	Stack Diameter (ft)	Stack Height (ft)	SCFM	m/s	Temp (F)
-87.939444	0.50	28	696	18.0	95
-87.939411	3	32	15500	11	75
-87.939211	2	35.7	6000	9.7	100
-87.940446					
-87.940504					
-87.940495					
-87.940429					
-87.939029					
-87.939048					

Willowbrook 2

Building height (not including office) about 23 feet

Building height (office) about 12.5 feet

Map Reference	Description	Lattitude
A	Scrubber Exhaust	41.749306
B	4 Chamber Backvents	41.749478
C	EXHAUST FOR CHAMBER ROOM	41.749259
D	Building Corner	41.748975
E	Building Corner	41.748861
F	Building Corner	41.748869
G	Building Corner	41.748984
H	Building Corner	41.749527
I	Building Corner	41.749523
J	Chamber blast vents	
K	Gas storage blast vents	
L	Sky lights	
M	AERATION ROOM 1 MAKE UP AIR	
N	AERATION ROOM 2 MAKE UP AIR	
O	SHIPPING MAKE UP AIR	
P	CHAMBER ROOM EXHAUST FAN	
Q	WORK AISLE EXHUAST FAN	
R	WORK AISLE MAKE UP AIR	
S	RECEIVING MAKE UP AIR	
T	4 (4' EXHAUST FANS ON SIDE WALLS	
U	AAT TOWER ROOM EXHAUST FAN	
V	CHILLER	
W	OFFICE AC UNIT	

Longitude	Stack Diameter (ft)	Stack Height (ft)	SCFM	m/s	Temp (F)
-87.941782	2.5	32	10150	10.50	75
-87.941697	1.17	33	3500	16.54	100
-87.941686	2.5	26	3140	3.25	100
-87.941817					
-87.941663					
-87.941215					
-87.941066					
-87.941085					
-87.941828					

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 12/20/2017 7:07:17 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Bollweg, George [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1592106e02634bb2bda8cc788b125f2c-GBollweg]
Subject: Ele and Sterigenics letters
Attachments: Ele EtO letter.doc; Sterigenics EtO letter .doc

Here are my draft letters. Before I print them I wanted to send them for review first and maybe we should send to Peggy? Let me know.

Margaret

Appointment

From: Martinez, Isidra [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F8B8FE5BB9774E1DAAAF8D45C628A535-IMARTINE]
Sent: 7/20/2018 7:11:36 PM
To: Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Thiede, Kurt [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3cc09fac5acc4ce1ba689fb2ce70d459-Thiede, Kur]; Payne, James [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=61b3204a683041079512b122c580a569-Payne, Jame]
CC: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]

Subject: Sterigenics Briefing
Attachments: R5 EtO Sources RA Briefing.pptx; Sterigenics briefing 072318.docx; 2018July23-R5 EtO Sources-RA Briefing.docx
Location: RA's Small Conf. Rm.

Start: 7/23/2018 7:00:00 PM
End: 7/23/2018 7:30:00 PM
Show Time As: Tentative

Message

From: Hoffman, Kathy [KHoffman@sterigenics.com]
Sent: 8/8/2018 9:59:33 PM
To: Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]
CC: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Sterigenics call follow-up
Attachments: WB Stack Coordinates and info.xlsx; WB Stacks and coordinates 2.docx

Thank you Ed for the call summary.

Attached is the information on the stack parameters and building dimensions that was requested. They also labeled each of the penetrations that were visible on the Google Image. I hope this information is helpful for your computer modelling.

Regards,
Kathy

From: Nam, Ed [mailto:nam.ed@epa.gov]
Sent: Friday, August 03, 2018 4:52 PM
To: Hoffman, Kathy
Cc: Siegel, Kathryn; Sieffert, Margaret; Cain, Alexis
Subject: Sterigenics call follow-up

Hi Kathy—

Thanks to you and your team for another very productive conference call. I'm pleased that we were able to get through these technical issues, with just a few follow-ups needs. Here is our understanding of what those follow-ups are:

EPA will provide to Sterigenics:

- Information about method 320, including a list of companies able to perform the test and an explanation of why we are recommending this method.
- EPA's sampling plan used during the cannister sampling in Willowbrook, the lab reports and calibration curves (if possible), and the met data.

Sterigenics will:

- Provide requested stack parameters and building dimensions for modeling.
- Provide a link to information about long-term EtO monitoring in New England.
- Review information about potential use of an IR camera for leak detection.

We will have a follow-up call the week after next. I suggest 9:00 or 10:00am on either Thursday, August 16 or Friday, August 17.

Thanks again.
-Ed

-Edward Nam, PhD
Director, Air and Radiation Division
US EPA, Region 5, Mail code A-18J
77 W. Jackson Blvd.
Chicago, IL 60604-3590
Phone 312-353-2192 nam.ed@epa.gov

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Message

From: Ogulei, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=C3E66FB31CD74EDB89554389D19D6977-DOGULEI]
Sent: 7/12/2018 3:38:23 PM
To: Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Sterigenics, July 18

That makes sense. I have a meeting at 2:30 and I was trying to determine whether we would be back by then.

From: Cain, Alexis
Sent: Thursday, July 12, 2018 10:28 AM
To: Ogulei, David <Ogulei.David@epa.gov>
Subject: RE: Sterigenics, July 18

No certainty. I would think we'd be done with the meeting by 12:00, or 12:30 at the latest. Not sure whether people will want a leisurely lunch in Willowbrook after that, or if we'll speed back to the office. Do you need to be back by any particular time?

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Ogulei, David
Sent: Thursday, July 12, 2018 10:25 AM
To: Cain, Alexis <cain.alexis@epa.gov>
Subject: RE: Sterigenics, July 18

Alexis,

Do you know what time we expect to be back to the office on Wednesday?

From: Cain, Alexis
Sent: Tuesday, July 10, 2018 2:29 PM
To: Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Ogulei, David <Ogulei.David@epa.gov>; Marcus, Danny <marcus.danny@epa.gov>
Cc: Furey, Eileen <furey.eileen@epa.gov>; Olson, Erik <olson.erik@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>; Biggs, Christopher <biggs.christopher@epa.gov>
Subject: Sterigenics, July 18

We are tentatively scheduled to visit Sterigenics in Willowbrook on Wednesday, July 18, arriving at 10:00. I believe that the people going are:
Ed
Katie
Alexis
Margaret
David and/or Danny—you are welcome to come if you are interested/available. Please let me know.

If there's anyone else who should go, please let me know.

Tentatively, this is a no-lawyers meeting, but I'll let ORC know if that changes.

I'm working on getting a car. We'll need to leave from the office not much after 9:00. If you're going to the meeting, but will go directly from home, please let me know that.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

Message

From: Sieffert, Margaret [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DBB22FA4A9B14C1E8C634B2E0791CEFA-MSIEFFER]
Sent: 9/28/2018 12:14:12 PM
To: Rountree, Jillian [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7d304e5e55a54908b24b17e57ecdbf3c-JRountre]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]
Subject: RE: Willowbrook Sterigenics

Deliberative Process / Ex. 5

-Margaret

From: Rountree, Jillian
Sent: Thursday, September 27, 2018 4:17 PM
To: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Subject: RE: Willowbrook Sterigenics

Do we have any updates on this?

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5
312-353-3849
Some of my email messages and attachments contain information that is privileged, confidential, or prohibited from disclosure under applicable law. If you believe you may have received this message in error, please inform the sender immediately. Further, do not read, print, or distribute any messages or attachments received in error. Immediately delete and otherwise destroy any such messages and attachments. Thank you.

From: Sieffert, Margaret
Sent: Wednesday, September 12, 2018 2:41 PM
To: Cain, Alexis <cain.alexis@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>
Subject: FW: Willowbrook Sterigenics

FYI

From: Som, Kushal
Sent: Wednesday, September 12, 2018 2:37 PM
To: Star, David <star.david@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Trine, Rae <trine.rae@epa.gov>; Martig, Anton (Tony) <martig.anton@epa.gov>; Wesley, Abigail <wesley.abigail@epa.gov>; Myhre, John <myhre.john@epa.gov>
Subject: RE: Willowbrook Sterigenics

Dave-

Velu Senthil, of the TRI Program, asked his contractor to contact the company. I'll contact Velu to see if he can answer these questions. I'll also ask for the E-mail company correspondence they used to make the determination.

--Kush

Kushal Som

Environmental Engineer
U.S. EPA Region 5
77 West Jackson Blvd. LC-17J
Chicago, IL 60604-3590
(312) 353-5792

From: Star, David
Sent: Wednesday, September 12, 2018 2:31 PM
To: Som, Kushal <som.kushal@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Trine, Rae <trine.rae@epa.gov>; Martig, Anton (Tony) <martig.anton@epa.gov>; Wesley, Abigail <wesley.abigail@epa.gov>; Myhre, John <myhre.john@epa.gov>
Subject: RE: Wiilowbrook Sterigenics

Deliberative Process / Ex. 5

David Star

David Star
Chief, Pesticides & Toxics Compliance Section
Chemicals Management Branch
U.S. EPA Region 5 - Chicago
312-886-6009 (telephone)
312-692-2536 (facsimile)
EPA United States Environmental Protection Agency

From: Som, Kushal
Sent: Wednesday, September 12, 2018 2:19 PM
To: Star, David <star.david@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Trine, Rae <trine.rae@epa.gov>; Martig, Anton (Tony) <martig.anton@epa.gov>; Wesley, Abigail <wesley.abigail@epa.gov>; Myhre, John <myhre.john@epa.gov>
Subject: FW: Wiilowbrook Sterigenics

Hi Dave-

Here's the update from HQ. They believe that each of the Sterigenics facilities are not subject to TRI (see below).

Please let me know if you have any questions.

--Kush

Kushal Som
Environmental Engineer
U.S. EPA Region 5
77 West Jackson Blvd. LC-17J
Chicago, IL 60604-3590
(312) 353-5792

From: Senthil, Velu
Sent: Wednesday, September 12, 2018 2:00 PM
To: Som, Kushal <som.kushal@epa.gov>; Martig, Anton (Tony) <martig.anton@epa.gov>
Cc: Senthil, Velu <Senthil.Velu@epa.gov>
Subject: Wiilowbrook Sterigenics

Hi Kush,
I accidentally might have deleted your email about Sterigenics facility in R5.

Here is the response that I got from the contractor:

8/8/18: Sent email to TC; 8/17/18: Through email correspondence with one of the Sterigenics facilities, we have learned that their facilities classified in NAICS 561910 are outside of EPCRA section 313 requirements and will not be reporting to TRI for RY2017 or in the future.

Hope this is helpful.

Thanks

Velu Senthil

Message

From: Cain, Alexis [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=0249D52AFE7A491EA6859BF276E694E9-ACAIN]
Sent: 6/22/2018 10:10:25 PM
To: Hoffman, Kathy [KHoffman@sterigenics.com]
CC: Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Damico, Genevieve [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7d289d99160143fdafee7039dc99807a-GDamico]; Olson, Erik [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b05e7846315e4bf4b9d0df0afdb3eb43-EOlson02]
Subject: RE: Technical Conference

Thanks Kathy—we'll try to get back to you with a time that works for us and Illinois EPA by Monday.

Have a great weekend!

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Hoffman, Kathy [mailto:KHoffman@sterigenics.com]
Sent: Friday, June 22, 2018 4:58 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Subject: Technical Conference

Per our discussion this afternoon, following are some time periods next Wednesday and Thursday for an hour call to discuss technical details of this project:

- Wednesday: Anytime from 11am to 2pm
- Thursday: Anytime from 11 to 2:30pm

I am also working with Ramboll to review your EO monitoring and modelling studies. They may have some technical questions on these studies. I have suggested that they provide me a list of any questions and that I can bring this list to our technical conference call too.

Regards,
Kathy

Kathleen Hoffman
Senior Vice President - Global Environmental, Health & Safety and Technical Services
Sterigenics, A Sotera Health Company
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khoffman@sterigenics.com

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Message

From: Cain, Alexis [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=0249D52AFE7A491EA6859BF276E694E9-ACAIN]
Sent: 9/25/2018 8:06:36 PM
To: Hoffman, Kathy [KHoffman@sterigenics.com]
CC: Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; bftaylor@sidley.com; Thiede, Kurt [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3cc09fac5acc4ce1ba689fb2ce70d459-Thiede, Kur]
Subject: RE: Sterigenics call follow-up

Hello Kathy—we heard from HQ on Friday that their contractor is still working on pulling together the requested information. We'll pass it along as soon as we get it.

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Hoffman, Kathy [mailto:KHoffman@sterigenics.com]
Sent: Tuesday, September 25, 2018 1:53 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Cc: Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; bftaylor@sidley.com; Thiede, Kurt <thiede.kurt@epa.gov>
Subject: RE: Sterigenics call follow-up

Alexis:

I was just checking in to see if you were able to get the requested information on the monitoring and the raw data from the analyses.

Thank you,
Kathy

From: Cain, Alexis [mailto:cain.alexis@epa.gov]
Sent: Thursday, September 13, 2018 10:21 AM
To: Hoffman, Kathy
Cc: Nam, Ed; Siegel, Kathryn; Sieffert, Margaret; bftaylor@sidley.com; Thiede, Kurt
Subject: RE: Sterigenics call follow-up

Hi Kathy—Just wanted to let you know we've received this request and are working on it. Getting you the answers is taking some time because much of this information is in HQ or with our contractor. Please let me know if you have any questions about the request for modeling information that I sent on 9/7.
Thanks!

Alexis Cain
USEPA-Region 5
(312) 886-7018

cain.alexis@epa.gov

From: Hoffman, Kathy [mailto:KHoffman@sterigenics.com]
Sent: Friday, September 07, 2018 2:53 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Cc: Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; bftaylor@sidley.com; Thiede, Kurt <thiede.kurt@epa.gov>
Subject: RE: Sterigenics call follow-up

Alexis:

Thank you very much for this prompt response. This is indeed the information that we reviewed. For a more in-depth evaluation, we would like to request the following:

1. Please address whether any field blanks or other field QC samples were collected and please provide the field notes or records showing canister pressure/regulator readings before, during and at the end of sample collection periods, with any observations noted in the field during sample collection.

2. Please provide all reports and "raw data" documentation from the laboratory ERG related to validation of the detection limits used and analysis of the field samples and related QC samples, including:
    a. Chromatograms and instrument printouts from the GC/MS for all samples, blanks and QC samples
    b. Copies of chains of custody records related to the samples
    c. Laboratory records of spike sample results, daily calibration and other QC steps taken during the analysis of the samples
    d. Regarding the previously provided document headed "calrpt.txt," please provide a narrative description explaining when these apparent internal standards/spikes were run and the actual spike concentrations.
    e. Any reports, SOPs or similar documents maintained by the laboratory regarding modifications and alterations of EPA Method TO-15 to operate SIM mode with low-level detection limits for ethylene oxide.
    f. All validation information and reports related to establishing and verifying the detection limits and reporting limits achieved, including records or reports regarding peak heights (response factors) and signal-to-noise comparisons.
    g. Regarding the previously provided document headed "Data Review Report," please provide a narrative description of whether this represents the full extent of calibration samples run and whether there were additional calibration curves prepared or run during the course of analyzing the samples.
    h. All records and reports regarding the pre-cleaning of the canisters shipped for this study, including cleaning methods and analyses used to verify and certify canisters free of potentially interfering substances.

Thank you again for your assistance.

Kathy

From: Cain, Alexis [mailto:cain.alexis@epa.gov]
Sent: Friday, September 07, 2018 1:21 PM
To: Hoffman, Kathy
Cc: Nam, Ed; Siegel, Kathryn; Sieffert, Margaret; bftaylor@sidley.com
Subject: FW: Sterigenics call follow-up

Kathy-- Here are our monitoring sampling plan, met data, lab reports, and calibration curves. Please let me know if there is additional information about the monitoring that you would like to see.

Alexis Cain

USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Cain, Alexis
Sent: Thursday, August 09, 2018 1:14 PM
To: 'Hoffman, Kathy' <KHoffman@sterigenics.com>
Cc: Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nguyen, Phuong <Nguyen.Phuong@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>; 'Jeffrey Sprague' <Jeff.Sprague@Illinois.gov>; 'King, Steven' <Steven.King@Illinois.gov>; Mattison, Kevin <Kevin.Mattison@Illinois.gov>; Shappley, Ned <Shappley.Ned@epa.gov>; Witt, Jon <Witt.Jon@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>; Marcus, Danny <marcus.danny@epa.gov>; Ogulei, David <Ogulei.David@epa.gov>; 'Armitage, Julie' <Julie.Armitage@Illinois.gov>; Wayland, Richard <Wayland.Richard@epa.gov>; Shelow, David <Shelow.David@epa.gov>
Subject: RE: Sterigenics call follow-up

Hi Kathy—

Attached are the sampling plan, met data, lab reports, and calibration curves. There are a few redactions, related to pre-decisional EPA materials. We still owe you some information about method 320, which should be coming soon.

We received the information you sent about the stack parameters and building dimensions. Thank you.

I hope we can schedule a time to follow-up next week.
Thanks
Alexis

From: Nam, Ed
Sent: Friday, August 03, 2018 4:52 PM
To: Hoffman, Kathy <KHoffman@sterigenics.com>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Subject: Sterigenics call follow-up

Hi Kathy—

Thanks to you and your team for another very productive conference call. I'm pleased that we were able to get through these technical issues, with just a few follow-ups needs. Here is our understanding of what those follow-ups are:

EPA will provide to Sterigenics:

- Information about method 320, including a list of companies able to perform the test and an explanation of why we are recommending this method.
- EPA's sampling plan used during the cannister sampling in Willowbrook, the lab reports and calibration curves (if possible), and the met data.

Sterigenics will:

- Provide requested stack parameters and building dimensions for modeling.
- Provide a link to information about long-term EtO monitoring in New England.
- Review information about potential use of an IR camera for leak detection.

We will have a follow-up call the week after next. I suggest 9:00 or 10:00am on either Thursday, August 16 or Friday, August 17.

Thanks again.
-Ed

-Edward Nam, PhD
Director, Air and Radiation Division
US EPA, Region 5, Mail code A-18J
77 W. Jackson Blvd.
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Phone 312-353-2192 nam.ed@epa.gov

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This e-mail and any files transmitted with it may contain privileged and/or confidential information. If you believe this e-mail or any of its attachments were not intended for you, you must not use, distribute, forward, print or copy this e-mail or any attached files. If you have received this e-mail in error, please notify the sender by reply e-mail and then immediately delete the email and all attachments.

Message

Sent: 8/9/2018 5:27:29 PM
To: Hoffman, Kathy [KHoffman@sterigenics.com]
CC: Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Nguyen, Phuong [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f07188263d014e06a28762ccf129ce20-PNguyen]; Nwia, Jacqueline [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d299b56bd7ef46709fb7465fd1e15466-JNwia]; Jeffrey Sprague [Jeff.Sprague@Illinois.gov]; King, Steven [Steven.King@Illinois.gov]; Mattison, Kevin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=userff092538]; Shappley, Ned [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5fc7fde372054ab5ac38f24b9072b73d-Shappley, N]; Witt, Jon [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ea00bc6f645b438682026a77a8d4267c-Witt, Jonat]; Smith, Darcie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3ae3c2377efb42879b943db8796ddc05-Smith, Darcie]; Marcus, Danny [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a34c75d25a6243e68733a8ee7e2ddf82-DMarcus]; Ogulei, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c3e66fb31cd74edb89554389d19d6977-DOgulei]; Armitage, Julie [Julie.Armitage@Illinois.gov]; Wayland, Richard [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d69f0a870909402ebd66847003aa6437-Wayland, Chet]; Shelow, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3859abc25e634d418478f3d3ca569c79-Shelow, David]
Subject: RE: Sterigenics call follow-up
Attachments: 2018May10-EtOSamplingPlan_For Sterigenics.pdf; Willowbrook_MetData_0515-0519_For Sterigenics.pdf; 20180703_Sterigenics Monitoring Report_For Sterigenics.pdf; calrpt.pdf; 0182_001.pdf

Hi Kathy—

Attached are the sampling plan, met data, lab reports, and calibration curves.

From: Nam, Ed
Sent: Friday, August 03, 2018 4:52 PM
To: Hoffman, Kathy <KHoffman@sterigenics.com>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Subject: Sterigenics call follow-up

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Sterigenics will:

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- Provide a link to information about long-term EtO monitoring in New England.
- Review information about potential use of an IR camera for leak detection.

We will have a follow-up call the week after next. I suggest 9:00 or 10:00am on either Thursday, August 16 or Friday, August 17.

Thanks again.
-Ed

-Edward Nam, PhD
Director, Air and Radiation Division
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Data Review Report

Printed: 05/21/2018 12:39 pm

Analysis	Analyte	CalResult	True Value	% D	% Rec
Lab ID: 1805055-CAL1 Cal Standard					
TO-15 2018 Ethylene Oxide	Ethylene oxide	0.24	0.250	-3.00	97.00
Lab ID: 1805055-CAL2 Cal Standard					
TO-15 2018 Ethylene Oxide	Ethylene oxide	0.43	0.500	-14.41	85.59
Lab ID: 1805055-CAL3 Cal Standard					
TO-15 2018 Ethylene Oxide	Ethylene oxide	0.88	1.00	-11.61	88.39
Lab ID: 1805055-CAL4 Cal Standard					
TO-15 2018 Ethylene Oxide	Ethylene oxide	2.68	2.50	7.26	107.26
Lab ID: 1805055-CAL5 Cal Standard					
TO-15 2018 Ethylene Oxide	Ethylene oxide	5.23	5.00	4.60	104.60

5-11-18

SUBJECT: Sterigenics, Willowbrook, IL: Ethylene Oxide Air Monitoring

PREPARED BY:

Jacqueline Nwia
Environmental Scientist
Air Monitoring and Analysis Section
Region 5

FIELD MONITORING CONDUCTED BY:

Jacqueline Nwia
Environmental Scientist
Air Monitoring and Analysis Section
Region 5

Margaret Sieffert
Environmental Scientist
Toxics and Global Atmospheres Section
Region 5

FIELD MONITORING REQUESTED BY:

Alexis Cain
Section Chief
Toxics and Global Atmospheres Section
Region 5

DATES OF FIELD MONITORING: May 16-18, 2018

REPORT AUTHORIZED BY:

7/3/18

Michael Compher
Supervisor
Air Monitoring and Analysis Section
Region 5

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ED_002192_00005718-00003

Methods:

US EPA Region 5 (R5) utilized the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air Second Edition Compendium Method TO-15 Determination Of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/ Mass Spectrometry (GC/MS) (TO-15) for analyzing samples collected in the area near Sterigenics in Willowbrook, IL. The method entails collecting 12-hour composite or grab ambient air samples in SUMMA canisters, which were prepared by a contract laboratory (Eastern Research Group (ERG) through EPA's national air toxics contract. Once samples were collected, the canisters containing the sampled air were shipped to ERG for ethylene oxide (EtO) analysis using GC/MS.

To aid in the assessment of EtO concentrations, a portable meteorological tower was installed on the roof of a nearby building [redacted] @ 600 Joliet Road, Willowbrook, IL). The meteorological tower collected 5-minute wind speed and wind direction values. The latitude/longitude location of each sample, either 12-hour composite or grab, was recorded using latitude/longitude points obtained through a mobile phone compass application. A sampling plan and Quality Assurance Project Plan (QAPP) were developed for this project. Additional information can be found in the sampling plan (2018May10-EtOSsamplingPlan) and Quality Assurance Project Plan (Sterigenics_QAPP_1.0).

In accordance with the QAPP, ambient EtO concentrations are compared to the minimum detection limit (MDL) which was determined by ERG to be 0.082 ug/m^3 (previously, the MDL was 0.0907 ug/m^3. However, ERG calibrated and recalculated the MDL just prior to analyzing the canister samples from Willowbrook to 0.082 ug/m^3), a concentration associated with an upper-bound lifetime probability of developing cancer of about 410 in a million if exposure occurred continuously at that concentration for 70 years. EPA's revised (2016) upper bound inhalation unit risk estimate of EtO cancer potency is 0.005[1] per ug/m^3. R5 collected ambient air samples around the Sterigenics facility on May 15-18, 2018 to evaluate the concentrations of EtO.

Quality Assurance/Quality Control (QA/QC)

ERG adhered to QA/QC procedures established in their QAPP[2] which was approved by EPA on May 19, 2017. ERG's quality assured/controlled raw data results were provided to EPA in Excel spreadsheet format[3]. In addition to calibration checks and blank sample analysis, ERG performed replicate analysis of each duplicate sample collected in accordance with their QA/QC procedures. All results passed the QA/QC data analysis.

Data Validation

R5's Sterigenics project QAPP[4] requires data validation review by the QA Coordinator, Bilal Qazzaz, to determine whether DQOs are met. However, due to reassignment of work, Marta Fucco, of the Air

[1] EPA/635/R-16/350Fa, www.epa.gov/iris. Evaluation of the Inhalation Carcinogenicity of Ethylene Oxide (CASRN 75-21-8) In Support of Summary Information on the Integrated Risk Information System (IRIS). December 2016, National Center for Environmental Assessment, Office of Research and Development, U.S. Environmental Protection Agency, Washington, DC.

[2] Support for the EPA National Monitoring Programs (UATMP, NATTS, CSATAM, PAMS, and NMOC Support) Contract No. EP-D-14-030 2017 Quality Assurance Project Plan Category 1.

[3] Eto may 18 voc.xls file sent from [redacted] (ERG) to U.S. EPA on May 30, 2018.

[4] Quality Assurance Project Plan; Sterigenics, Willowbrook, Illinois Ethylene Oxide Air Monitoring Study (Sterigenics_QAPP_1.0)

Monitoring and Assessment Section (AMAS) conducted the data validation review[5]. Data validation procedures identified two invalid data points, specifically, 2 collocated data points (LABSAMPIDs 8051813-08 and 8051813-09) collected on May 16, 2018 (0.158 ug/m^3 and 0.405 ug/m^3) which didn't meet the acceptance criteria of ≤ 30% relative percent difference (RPD) or 5 times the MDL. These 2 data points had an RPD of over 87% (See tables in Appendix A). The 0.158 ug/m^3 value was the lowest sample value collected during this sampling campaign, and it is more challenging for low concentration collocated measure values to meet the 30% RPD criteria.

Data Quality Objectives

The primary objective of ambient air monitoring was to determine whether ethylene oxide is detectable near the Sterigenics facility. Other objectives were to determine how the ambient levels [redacted] more refined AERMOD modeled concentrations[6]. Data is of sufficient quantity and quality to address these questions.

Data quality objectives (DQO) and criteria are identified in the QAPP as follows:

1. Data completeness is 75% of total samples.
    a. Although 2 data points were invalidated out of the total 19 12-hour composite samples, 17 were validated, exceeding the 75% DQO established in the QAPP
    b. All 17 grab samples were validated, exceeding the 75% DQO established in the QAPP.
    c. All samples exceed the ERG's MDL of 0.082 ug/m^3.
    d. Despite shifting winds, review of the data concludes that sufficient downwind samples were collected.

Quality assurance, quality control and data quality objectives and criteria are met with the sampling and analysis conducted for this study.

Results

The tables, graphs and maps below present and illustrate the data and results collected May 16-18, 2018. Table 1 presents all samples and EtO concentrations collected for this study while Tables 2 and 3 separate the 12-hour composite and grab samples. EtO concentrations above the MDL were measured for all 12-hour composite and grab samples.

Table 1: All Results Table (QX=Invalidated data: Failed QC Criteria)

Sampling Date	Sampling Time	Canister Number	Sample Duration	EtO (ug/m^3)	Detection Limit (ug/m^3)
5/16-17/2018	6:41PM - 6:20AM	A21042	11 hrs 39 min	9.09	0.164
5/16-17/2018	6:41PM - 6:20AM	SAT027	11 hrs 39 min (dupicate)	8.33	0.164
5/17/2018	7:27AM - 6:52PM	19650	11 hrs 25 min	8.236	0.082
5/17-18/2018	6:58PM - 6:37AM	18827	11 hrs 39 min	4.94	0.082
5/17/2018	6:54AM - 6:15PM	19662	11 hrs 21 min	4.56	0.082
5/16/2018	1:26 PM	SAT085	Grab	4.34	0.082
5/16/2018	1:12 PM	5132	Grab	4.27	0.082

[5] Deviations from Sterigenics QAPP, Memorandum from Jacqueline Nwia to Bilal Qazzaz, July 3, 2018

[6] [redacted] More refined AERMOD modeling was performed by Region 5's Air Toxics and Assessment Branch staff based on estimated inputs.

Sampling Date	Sampling Time	Canister Number	Sample Duration	EtO (ug/m³)	Detection Limit (ug/m³)
5/16-17/2018	7:01PM - 6:59AM	19641	11 hrs 58 min	3.87	0.082
5/17-18/2018	6:58PM - 6:37AM	5124	11 hrs 39 min (duplicate)	3.69	0.082
5/16/2018	7:21AM - 5:37PM	5142	10 hrs 16 min	3.55	0.082
5/16/2018	12:50 PM	SAT169	Grab (duplicate)	2.28	0.082
5/16/2018	12:50 PM	A21056	Grab	2.17	0.082
5/16-17/2018	7:28PM - 7:12AM	19652	11 hrs 44 min	2.12	0.082
5/16/2018	12:37PM	SAT094	Grab	1.57	0.082
5/17/2018	2:46 PM	SAT009	Grab	1.34	0.082
5/17/2018	10:42 AM	5052	Grab (duplicate)	1.04	0.082
5/17/2018	10:42 AM	SAT173	Grab	1.02	0.082
5/17/2018	6:29AM - 5:53PM	5017	11 hrs 24 min	1.01	0.082
5/17/2018	7:16AM - 6:23PM	18864	11 hrs 7 min	0.979	0.082
5/17/2018	2:33 PM	SAT034	Grab	0.936	0.082
5/17/2018	7:07AM - 6:30PM	5100	11 hrs 23 min	0.867	0.082
5/17/2018	6:29AM - 5:53PM	19290	11 hrs 24 min (duplicate)	0.789	0.082
5/16-17/2018	7:13PM - 7:01AM	SAT074	11 hrs 48 min	0.659	0.082
5/16/2018	7:37AM - 5:50PM	5090	10 hrs 13 min	0.518	0.082
5/17/2018	10:53 AM	A21012	Grab	0.494	0.082
5/16/2018	7:50AM - 5:44PM	SAT007	9 hrs 44 min	0.463	0.082
5/17/2018	2:53 PM	5072	Grab	0.447	0.082
5/17/2018	10:59 AM	5053	Grab	0.411	0.082
5/17/2018	10:20 AM	SAT095	Grab	0.405	0.082
5/16/2018	6:56AM - 5:12PM	SAT166	10 hrs 16 min	QX	0.082
5/16/2018	1:04 PM	SAT061	Grab	0.355	0.082
5/17/2018	10:32 AM	SAT133	Grab	0.338	0.082
5/17-18/2018	6:43PM - 6:29AM	5101	11 hrs 46 min	0.338	0.082
5/17/2018	10:33 AM	A21065	Grab	0.291	0.082
5/17/2018	2:36 PM	SAT101	Grab	0.243	0.082
5/16/2018	12:29PM	19644	Grab	0.221	0.082
5/17/2018	2:27 PM	19294	Grab (duplicate)	0.214	0.082
5/17/2018	3:05 PM	SAT020	Grab	0.206	0.082
5/17/2018	2:59 PM	19651	Grab	0.174	0.082
5/17/2018	2:27 PM	18875	Grab	0.163	0.082
5/16/2018	6:56AM - 5:09PM	19277	10 hrs 13 min (duplicate)	QX	0.082

Table 2: 12-hr Composite Sample Results (QX=Invalidated data: Failed QC Criteria)

Sampling Date	Sampling Time	Canister Number	EtO (ug/m^3)	Detection Limit (ug/m^3)
5/17/2018	7:27AM - 6:52PM	19650	8.236	0.082
5/17/2018	6:54AM - 6:15PM	19662	4.56	0.082
5/16-17/2018	7:01PM - 6:59AM	19641	3.87	0.082
5/16/2018	7:21AM - 5:37PM	5142	3.55	0.082
5/16-17/2018	7:28PM - 7:12AM	19652	2.12	0.082
5/17/2018	7:16AM - 6:23PM	18864	0.979	0.082
5/17/2018	7:07AM - 6:30PM	5100	0.867	0.082
5/16-17/2018	7:13PM - 7:01AM	SAT074	0.659	0.082
5/16/2018	7:37AM - 5:50PM	5090	0.518	0.082
5/16/2018	7:50AM - 5:44PM	SAT007	0.463	0.082
5/17-18/2018	6:43PM - 6:29AM	5101	0.338	0.082
5/16-17/2018	6:41PM - 6:20AM	A21042	9.09	0.164
5/16-17/2018	6:41PM - 6:20AM	SAT027	8.33	0.164
5/17-18/2018	6:58PM - 6:37AM	18827	4.94	0.082
5/17-18/2018	6:58PM - 6:37AM	5124	3.69	0.082
5/17/2018	6:29AM - 5:53PM	5017	1.01	0.082
5/17/2018	6:29AM - 5:53PM	19290	0.789	0.082
5/16/2018	6:56AM - 5:12PM	SAT166	QX	0.082
5/16/2018	6:56AM - 5:09PM	19277	QX	0.082

Table 3: Grab Sample Results

Sampling Date	Sampling Time	Canister Number	EtO (ug/m^3)	Detection Limit (ug/m^3)
5/16/2018	12:50 PM	SAT169	2.28	0.082
5/16/2018	12:50 PM	A21056	2.17	0.082
5/17/2018	10:42 AM	5052	1.04	0.082
5/17/2018	10:42 AM	SAT173	1.02	0.082
5/17/2018	2:27 PM	19294	0.214	0.082
5/17/2018	2:27 PM	18875	0.163	0.082
5/16/2018	1:26 PM	SAT085	4.34	0.082
5/16/2018	1:12 PM	5132	4.27	0.082
5/16/2018	12:37PM	SAT094	1.57	0.082
5/17/2018	2:46 PM	SAT009	1.34	0.082
5/17/2018	2:33 PM	SAT034	0.936	0.082
5/17/2018	10:53 AM	A21012	0.494	0.082
5/17/2018	2:53 PM	5072	0.447	0.082

Sampling Date	Sampling Time	Canister Number	EtO (ug/m^3)	Detection Limit (ug/m^3)
5/17/2018	10:59 AM	5053	0.411	0.082
5/17/2018	10:20 AM	SAT095	0.405	0.082
5/16/2018	1:04 PM	SAT061	0.355	0.082
5/17/2018	10:32 AM	SAT133	0.338	0.082
5/17/2018	10:33 AM	A21065	0.291	0.082
5/17/2018	2:36 PM	SAT101	0.243	0.082
5/16/2018	12:29PM	19644	0.221	0.082
5/17/2018	3:05 PM	SAT020	0.206	0.082
5/17/2018	2:59 PM	19651	0.174	0.082

The figures below were created using Excel and Geoplatform GIS application. Figure 1 is a time series plot illustrating grab and 12-hour composite samples throughout the sampling period. Figure 2 presents results for 12-hour composite and grab samples clustered by event (day/time). The maps illustrate each sampling event with the corresponding wind speed/wind direction plots. Figures 3-9 demonstrate the following:

- In general, predominant daytime winds were from the northeast resulting in higher ambient concentrations measured downwind of Sterigenics (southwest of the facility) (Figures 3,4,6,7 and 8).
- In general, predominant overnight winds were light and variable resulting in some of the highest concentrations measured closer to the facility (@ Willowbrook building) (Figures 5 and 9).
- As noted previously, all samples resulted in concentrations well above the MDL.
- The monitored ambient concentrations coupled with the wind roses demonstrate that Sterigenics is likely the source of the EtO detected in the ambient air since it is the largest source of EtO in the immediate area. The closest known other EtO sources are more than four miles away.

Figure 1: Time Series Plot: All Data

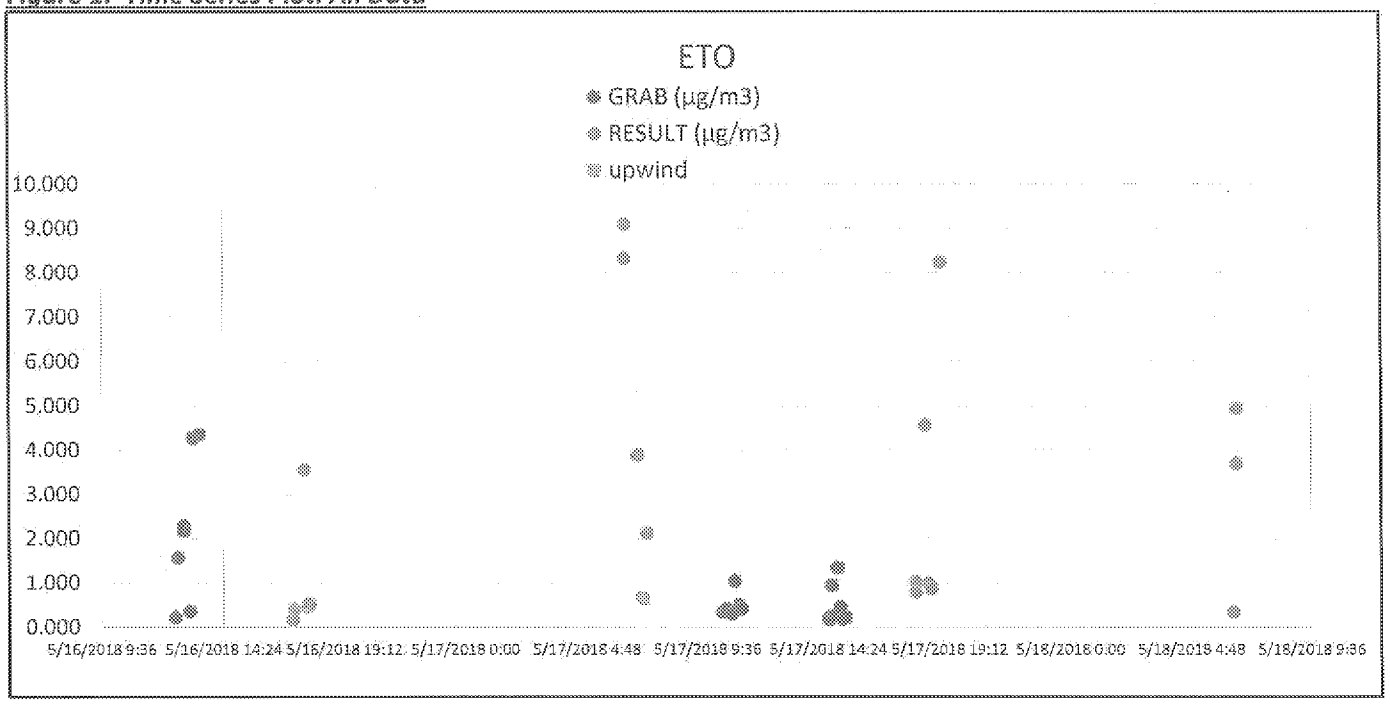


Figure 2: Results Clustered by Sampling Event (Day/time)

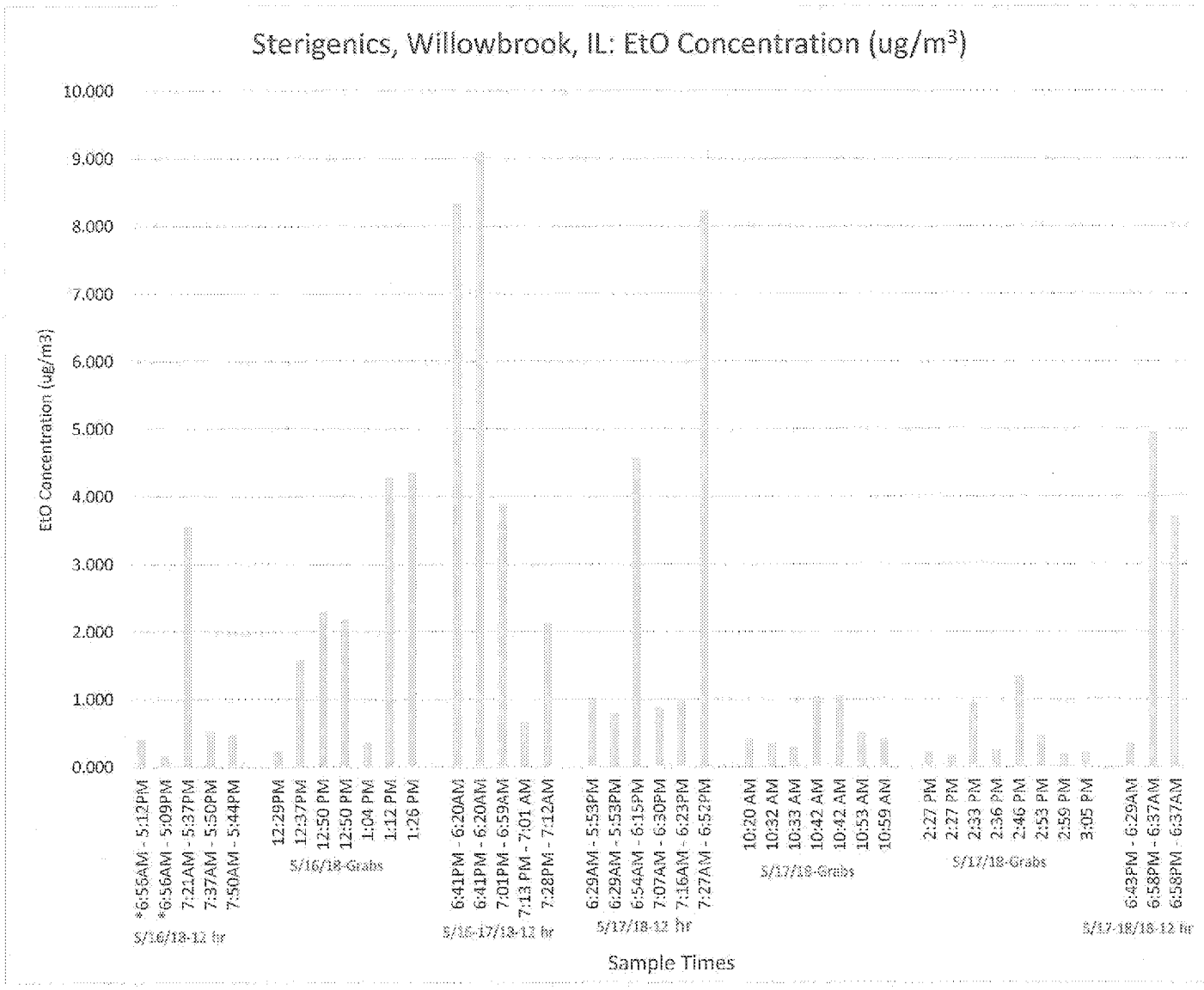


Figure 3: May 16, 2018: 12-hr Daytime Composite Results with Meteorological Data

Figure 4: May 16, 2018: Grab Sample Results with Meteorological Data

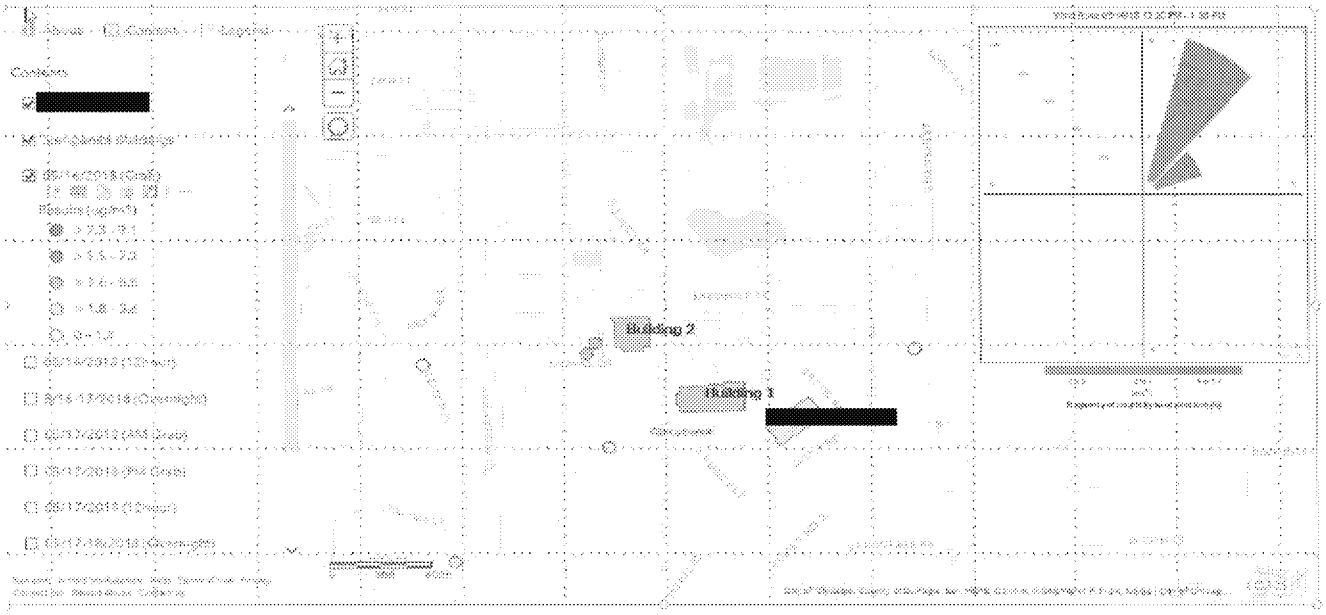


Figure 5: May 16-17, 2018: 12-hr Overnight Composite Results with Meteorological Data

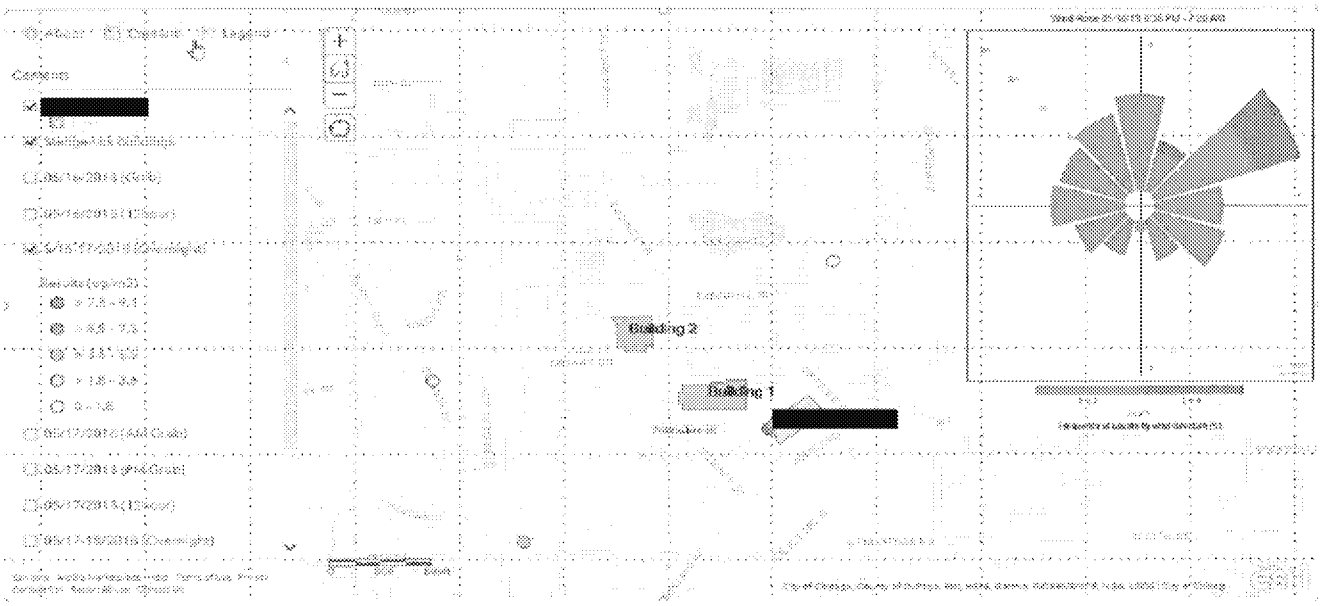


Figure 6: May 17, 2018: 12-hr Daytime Composite Results with Meteorological Data

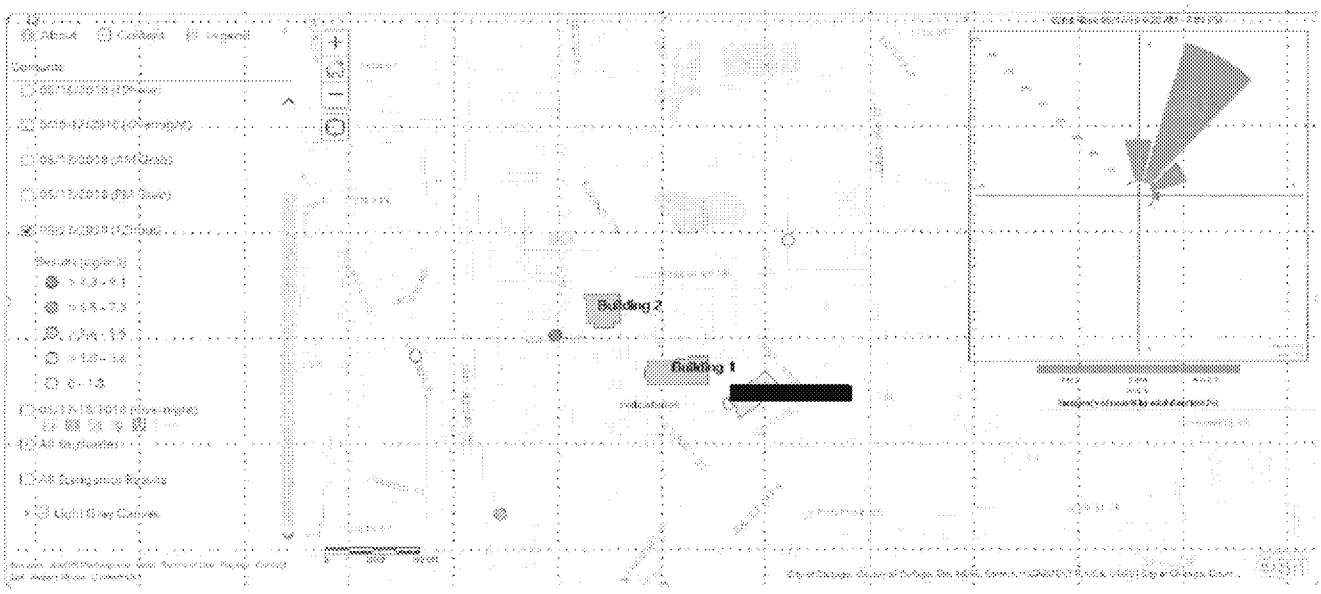


Figure 7: May 17, 2018: Mid-morning Grab Sample Results with Meteorological Data

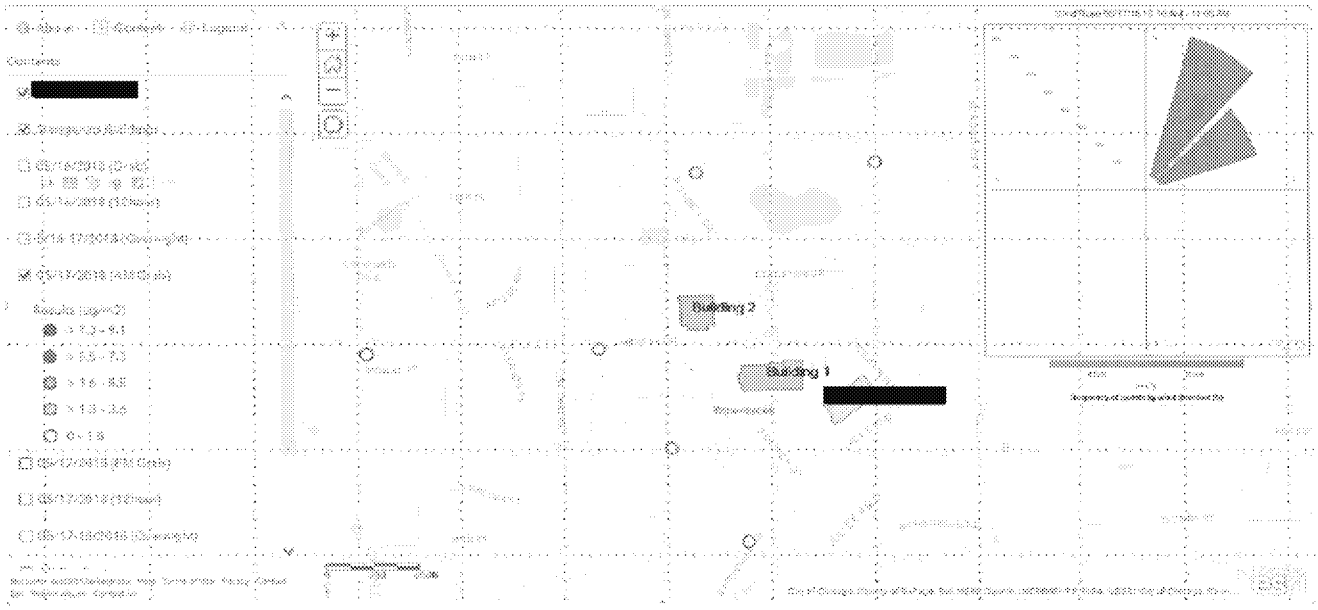


Figure 8: May 17, 2018: Mid-afternoon Grab Sample Results with Meteorological Data

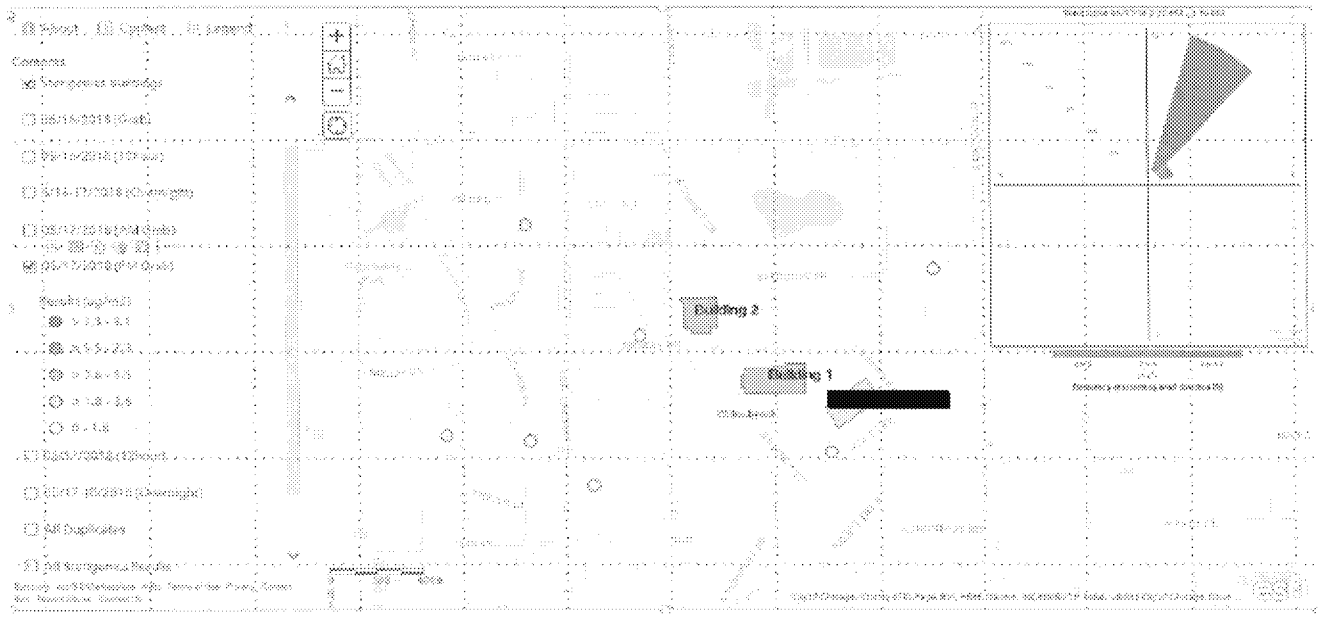
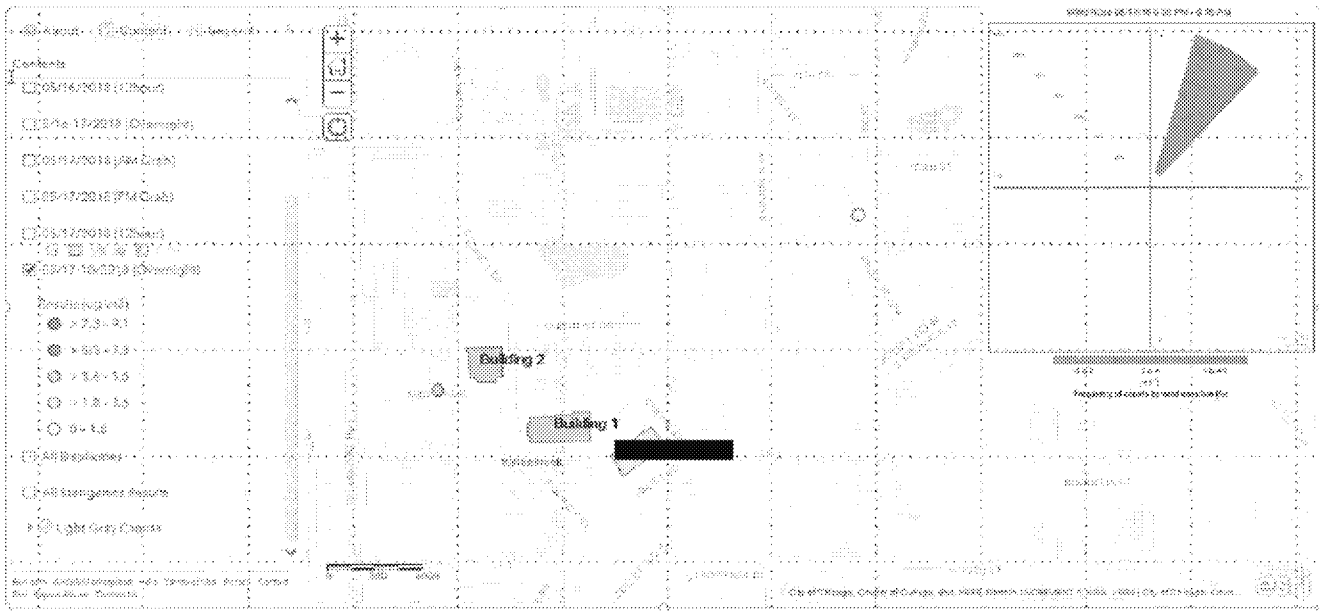


Figure 9: May 17-18, 2018: 12-hr Overnight Composite Results with Meteorological Data



Attachment A

SAMPLENAME	LABSAMPID	SAMPDATE	PREPDATE	ANADATE	RESULT (ppbv)	ANOTE	DL (ppbv)	RESULT (µg/m3)	ANOTE	DL (µg/m3)	RPD (ABS(L4-L5)/R4)*100	Arith Mean	5x MDL	Acceptance criteria (DUP) <30% RPD for cpds > 5xMDL)
EtO Grab 41.7489,-87.9353	8051813-01	5/16/2018 12:30	5/16/2018	5/22/2018	0.122		0.0453	0.221		0.082				
EtO Grab 41.7471,-87.9420	8051813-02	5/16/2018 12:38	5/16/2018	5/22/2018	0.867		0.0453	1.57		0.082				
EtO Grab D1 41.7450,-87.9454	8051813-03	5/16/2018 12:51	5/16/2018	5/21/2018	1.26		0.0453	2.28		0.082	4.878	2.23	0.410	YES
EtO Grab D2 41.7450,-87.9454	8051813-04	5/16/2018 12:51	5/16/2018	5/21/2018	1.2		0.0453	2.17		0.082				
EtO Grab 41.7486,-87.9461	8051813-05	5/16/2018 13:05	5/16/2018	5/22/2018	0.196		0.0453	0.355		0.082				
EtO Grab 41.7490,-87.9423	8051813-06	5/16/2018 13:13	5/16/2018	5/22/2018	2.36		0.0453	4.27		0.082				
EtO Grab 41.7483,-87.9459	8051813-07	5/16/2018 13:27	5/16/2018	5/22/2018	2.4		0.0453	4.34		0.082				
EtO D1 41.7474,-87.9385	8051813-08	5/16/2018 17:06	5/16/2018	5/21/2018	0.0673		0.0453	0.165	ND	0.082	37.918	0.282	0.410	NO
EtO D2 41.7474,-87.9385	8051813-09	5/16/2018 17:13	5/16/2018	5/21/2018	0.224		0.0453	0.405	ND	0.082				
EtO 41.7453,-87.9439	8051813-15	5/16/2018 17:37	5/16/2018	5/22/2018	1.96		0.0453	3.55		0.082				
EtO 41.7505,-87.9371	8051813-17	5/16/2018 17:44	5/16/2018	5/22/2018	0.256		0.0453	0.463		0.082				
EtO 41.7483,-87.9459	8051813-10	5/16/2018 17:50	5/16/2018	5/22/2018	0.286		0.0453	0.518		0.082				
EtO D1 41.7474,-87.9385	8051813-11	5/17/2018 6:20	5/16/2018	5/22/2018	5.02	D	0.0906	9.09	D	0.164	8.732	8.706	0.820	YES
EtO D2 41.7474,-87.9385	8051813-12	5/17/2018 6:20	5/17/2018	5/22/2018	4.6	D	0.0906	8.33	D	0.164				
EtO 41.7453,-87.9439	8051813-16	5/17/2018 6:50	5/17/2018	5/22/2018	2.14		0.0453	3.87		0.082				
Ethylene Oxide Upwind 12hr 41.7505,-87.9371	8051813-13	5/17/2018 7:01	5/17/2018	5/22/2018	0.364		0.0453	0.659		0.082				
EtO 41.7483,-87.9459	8051813-14	5/17/2018 7:12	5/17/2018	5/22/2018	1.17		0.0453	2.12		0.082				
EtO Grab 41.7519,-87.9373	8052134-04	5/17/2018 10:12	5/17/2018	5/23/2018	0.187		0.0453	0.338		0.082				
EtO Grab 41.7517,-87.9415	8052134-07	5/17/2018 10:20	5/17/2018	5/23/2018	0.224		0.0453	0.405		0.082				
EtO Grab 41.7484,-87.9493	8052134-01	5/17/2018 10:34	5/17/2018	5/23/2018	0.161		0.0453	0.291		0.082				
EtO Grab D1 41.7485,-87.9438	8052134-09	5/17/2018 10:42	5/17/2018	5/23/2018	0.564		0.0453	1.02		0.082	1.583	1.029	0.410	YES
EtO Grab D2 41.7485,-87.9438	8052134-10	5/17/2018 10:42	5/17/2018	5/23/2018	0.573		0.0453	1.04		0.082				
EtO Grab 41.7467,-87.9421	8052134-06	5/17/2018 10:53	5/17/2018	5/23/2018	0.273		0.0453	0.494		0.082				
EtO Grab 41.7450,-87.9403	8052134-15	5/17/2018 10:59	5/17/2018	5/23/2018	0.227		0.0453	0.411		0.082				
EtO Grab D1 41.7508,-87.9456	8052134-20	5/17/2018 14:27	5/17/2018	5/24/2018	0.0903		0.0453	0.163		0.082	26.596	0.189	0.410	YES
EtO Grab D2 41.7508,-87.9456	8052134-21	5/17/2018 14:27	5/17/2018	5/24/2018	0.118		0.0453	0.214		0.082				
EtO Grab 41.7469,-87.9455	8052134-19	5/17/2018 14:33	5/17/2018	5/24/2018	0.517		0.0453	0.936		0.082				
EtO Grab 41.7470,-87.9475	8052134-05	5/17/2018 14:36	5/17/2018	5/23/2018	0.134		0.0453	0.243		0.082				
EtO Grab 41.7461,-87.9440	8052134-02	5/17/2018 14:46	5/17/2018	5/23/2018	0.739		0.0453	1.34		0.082				
EtO Grab 41.7488,-87.9429	8052134-16	5/17/2018 14:53	5/17/2018	5/23/2018	0.247		0.0453	0.447		0.082				
EtO Grab 41.7500,-87.9360	8052134-17	5/17/2018 14:59	5/17/2018	5/24/2018	0.0961		0.0453	0.174		0.082				
EtO Grab 41.7467,-87.9384	8052134-03	5/17/2018 15:05	5/17/2018	5/23/2018	0.114		0.0453	0.206		0.082				
EtO D1 41.7474,-87.9385	8052134-22	5/17/2018 17:53	5/17/2018	5/24/2018	0.557		0.0453	1.01		0.082	24.271	0.899	0.410	YES
EtO D2 41.7474,-87.9385	8052134-23	5/17/2018 17:53	5/17/2018	5/24/2018	0.435		0.0453	0.789		0.082				
EtO 41.7453,-87.9439	8052134-08	5/17/2018 18:15	5/17/2018	5/23/2018	2.52		0.0453	4.56		0.082				
EtO 41.7483,-87.9459	8052134-18	5/17/2018 18:23	5/17/2018	5/24/2018	0.541		0.0453	0.979		0.082				
EtO 41.7505,-87.9371	8052134-24	5/17/2018 18:30	5/17/2018	5/24/2018	0.479		0.0453	0.867		0.082				
EtO 41.7487,-87.9426	8052134-14	5/17/2018 18:52	5/17/2018	5/23/2018	4.55		0.0453	8.236		0.082				

ED_002192_00005718-00015

SAMPLENAME	LABSAMPID	SAMPDATE	PREPDATE	ANADATE	RESULT (ppbv)	ANOTE	DL (ppbv)	RESULT (µg/m3)	ANOTE	DL (µg/m3)	RPD (ABS(L4-L5)/R4)*100	Arith Mean	5x MDL	Acceptance criteria (DUP) <30% RPD for cpds > 5xMDL)
EtO 41.7519,-87.9327	8052134-13	5/18/2018 6:29	5/18/2018	5/23/2018	0.187		0.0453	0.338		0.082				
EtO D1 41.7487,-87.9426	8052134-11	5/18/2018 6:37	5/18/2018	5/23/2018	2.73	D-F	0.0453	4.94	D-F	0.082	28.931	4.32	0.410	YES
EtO D2 41.7487,-87.9426	8052134-12	5/18/2018 6:37	5/18/2018	5/23/2018	2.04	D-F	0.0453	3.69	D-F	0.082				

Qualifier Codes: D = This result obtained by dilution; D-F = Duplicate exceeds DQO criteria; QX = Invalidated data/Failed QC Criteria

ED_002192_00005718-00016

Date	Time	Date_Time	WS	WD
5/15/2018	12:10	5/15/2018 12:10	4.3	35.2
5/15/2018	12:15	5/15/2018 12:15	5.6	37.5
5/15/2018	12:20	5/15/2018 12:20	4.9	27.4
5/15/2018	12:25	5/15/2018 12:25	4.5	29.6
5/15/2018	12:30	5/15/2018 12:30	5.4	30.9
5/15/2018	12:35	5/15/2018 12:35	5	43.2
5/15/2018	12:40	5/15/2018 12:40	3.9	22.2
5/15/2018	12:45	5/15/2018 12:45	3.7	29.9
5/15/2018	12:50	5/15/2018 12:50	4.7	40
5/15/2018	12:55	5/15/2018 12:55	4.6	45.6
5/15/2018	13:00	5/15/2018 13:00	4.4	33.7
5/15/2018	13:05	5/15/2018 13:05	4.2	32.1
5/15/2018	13:10	5/15/2018 13:10	3.4	41.2
5/15/2018	13:15	5/15/2018 13:15	3.4	25.5
5/15/2018	13:20	5/15/2018 13:20	2.9	36.2
5/15/2018	13:25	5/15/2018 13:25	3.6	54.9
5/15/2018	13:30	5/15/2018 13:30	3.2	65
5/15/2018	13:35	5/15/2018 13:35	3.3	69.5
5/15/2018	13:40	5/15/2018 13:40	3.9	59.3
5/15/2018	13:45	5/15/2018 13:45	2.8	83.6
5/15/2018	13:50	5/15/2018 13:50	3.4	68.3
5/15/2018	13:55	5/15/2018 13:55	3.7	59.1
5/15/2018	14:00	5/15/2018 14:00	3.6	61.3
5/15/2018	14:05	5/15/2018 14:05	2.9	67.3
5/15/2018	14:10	5/15/2018 14:10	2.7	68
5/15/2018	14:15	5/15/2018 14:15	3.4	82.1
5/15/2018	14:20	5/15/2018 14:20	4	63.5
5/15/2018	14:25	5/15/2018 14:25	4.3	53.4
5/15/2018	14:30	5/15/2018 14:30	3.4	46.4
5/15/2018	14:35	5/15/2018 14:35	3.9	54.9
5/15/2018	14:40	5/15/2018 14:40	4.6	61.6
5/15/2018	14:45	5/15/2018 14:45	4.5	62.4
5/15/2018	14:50	5/15/2018 14:50	3.6	57.5
5/15/2018	14:55	5/15/2018 14:55	4.5	59.5
5/15/2018	15:00	5/15/2018 15:00	5	53.9
5/15/2018	15:05	5/15/2018 15:05	5.1	53.8
5/15/2018	15:10	5/15/2018 15:10	4.6	53.9
5/15/2018	15:15	5/15/2018 15:15	3.9	46.2
5/15/2018	15:20	5/15/2018 15:20	4.6	29.4
5/15/2018	15:25	5/15/2018 15:25	4.8	16.5
5/15/2018	15:30	5/15/2018 15:30	4.5	14.4
5/15/2018	15:35	5/15/2018 15:35	4.7	35.8
5/15/2018	15:40	5/15/2018 15:40	4	23.7
5/15/2018	15:45	5/15/2018 15:45	4.4	12.7
5/15/2018	15:50	5/15/2018 15:50	4.2	11.9
5/15/2018	15:55	5/15/2018 15:55	4.6	3.3

5/15/2018	16:00	5/15/2018 16:00	4.7	19.1
5/15/2018	16:05	5/15/2018 16:05	4.3	16.2
5/15/2018	16:10	5/15/2018 16:10	4.6	18.4
5/15/2018	16:15	5/15/2018 16:15	4.2	22.8
5/15/2018	16:20	5/15/2018 16:20	4	11
5/15/2018	16:25	5/15/2018 16:25	3.7	358.7
5/15/2018	16:30	5/15/2018 16:30	4.1	13.7
5/15/2018	16:35	5/15/2018 16:35	4.6	351.5
5/15/2018	16:40	5/15/2018 16:40	4.5	358.2
5/15/2018	16:45	5/15/2018 16:45	4.6	8.8
5/15/2018	16:50	5/15/2018 16:50	3.7	8.2
5/15/2018	16:55	5/15/2018 16:55	4	352.4
5/15/2018	17:00	5/15/2018 17:00	4.4	12.3
5/15/2018	17:05	5/15/2018 17:05	4.3	17
5/15/2018	17:10	5/15/2018 17:10	4	16.4
5/15/2018	17:15	5/15/2018 17:15	2.7	4.6
5/15/2018	17:20	5/15/2018 17:20	4	354.5
5/15/2018	17:25	5/15/2018 17:25	4.3	353.1
5/15/2018	17:30	5/15/2018 17:30	4.1	359.4
5/15/2018	17:35	5/15/2018 17:35	4.7	4
5/15/2018	17:40	5/15/2018 17:40	5.1	350.5
5/15/2018	17:45	5/15/2018 17:45	4.5	354.7
5/15/2018	17:50	5/15/2018 17:50	4.5	11.1
5/15/2018	17:55	5/15/2018 17:55	4.9	9.7
5/15/2018	18:00	5/15/2018 18:00	4.5	3.1
5/15/2018	18:05	5/15/2018 18:05	4.8	352.4
5/15/2018	18:10	5/15/2018 18:10	4.5	1.6
5/15/2018	18:15	5/15/2018 18:15	4.3	16.3
5/15/2018	18:20	5/15/2018 18:20	4.6	21.7
5/15/2018	18:25	5/15/2018 18:25	4.8	15.6
5/15/2018	18:30	5/15/2018 18:30	4.6	14.9
5/15/2018	18:35	5/15/2018 18:35	4.1	4.8
5/15/2018	18:40	5/15/2018 18:40	4.6	4
5/15/2018	18:45	5/15/2018 18:45	4.7	14.6
5/15/2018	18:50	5/15/2018 18:50	4.6	14.4
5/15/2018	18:55	5/15/2018 18:55	5.2	13.6
5/15/2018	19:00	5/15/2018 19:00	4.2	5.4
5/15/2018	19:05	5/15/2018 19:05	3.4	1.3
5/15/2018	19:10	5/15/2018 19:10	4.3	358
5/15/2018	19:15	5/15/2018 19:15	4.2	4.5
5/15/2018	19:20	5/15/2018 19:20	3.6	5.1
5/15/2018	19:25	5/15/2018 19:25	3.7	5.5
5/15/2018	19:30	5/15/2018 19:30	4.2	6.9
5/15/2018	19:35	5/15/2018 19:35	4	13.3
5/15/2018	19:40	5/15/2018 19:40	3.9	8.4
5/15/2018	19:45	5/15/2018 19:45	4.1	3.3
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5/16/2018	6:35	5/16/2018 6:35	1.2	19.5
5/16/2018	6:40	5/16/2018 6:40	1.2	26.7
5/16/2018	6:45	5/16/2018 6:45	1.3	35.3
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5/16/2018	7:15	5/16/2018 7:15	1.1	6.7
5/16/2018	7:20	5/16/2018 7:20	1.2	9.5
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5/16/2018	14:15	5/16/2018 14:15	3.4	86.2
5/16/2018	14:20	5/16/2018 14:20	3.4	46.7
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5/16/2018	14:30	5/16/2018 14:30	4.1	66.8
5/16/2018	14:35	5/16/2018 14:35	4.1	61.1
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5/16/2018	15:20	5/16/2018 15:20	3.7	39.2
5/16/2018	15:25	5/16/2018 15:25	3.2	52.3

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5/16/2018	15:35	5/16/2018 15:35	3	39.6
5/16/2018	15:40	5/16/2018 15:40	2.4	86.2
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5/16/2018	16:05	5/16/2018 16:05	2.8	62.7
5/16/2018	16:10	5/16/2018 16:10	2.4	60
5/16/2018	16:15	5/16/2018 16:15	2.1	66.7
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5/16/2018	16:25	5/16/2018 16:25	2.6	70.8
5/16/2018	16:30	5/16/2018 16:30	3	71.1
5/16/2018	16:35	5/16/2018 16:35	2.5	68.7
5/16/2018	16:40	5/16/2018 16:40	2.4	98
5/16/2018	16:45	5/16/2018 16:45	2.8	75.3
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5/16/2018	17:15	5/16/2018 17:15	2.4	70.9
5/16/2018	17:20	5/16/2018 17:20	2.6	62.1
5/16/2018	17:25	5/16/2018 17:25	2.1	73.9
5/16/2018	17:30	5/16/2018 17:30	2.8	70.6
5/16/2018	17:35	5/16/2018 17:35	2.4	85.4
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5/16/2018	17:45	5/16/2018 17:45	2.6	77.3
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5/16/2018	18:15	5/16/2018 18:15	2.5	75.5
5/16/2018	18:20	5/16/2018 18:20	2.1	59.7
5/16/2018	18:25	5/16/2018 18:25	2.1	53.1
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5/16/2018	18:45	5/16/2018 18:45	2.4	68
5/16/2018	18:50	5/16/2018 18:50	2.4	69.6
5/16/2018	18:55	5/16/2018 18:55	2.3	73.1
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5/16/2018	19:05	5/16/2018 19:05	2.1	45.7
5/16/2018	19:10	5/16/2018 19:10	2.6	33
5/16/2018	19:15	5/16/2018 19:15	2.5	35.8
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5/16/2018	19:35	5/16/2018 19:35	2.1	62.9
5/16/2018	19:40	5/16/2018 19:40	1.8	64.1
5/16/2018	19:45	5/16/2018 19:45	1.6	71.5
5/16/2018	19:50	5/16/2018 19:50	1.6	73.3
5/16/2018	19:55	5/16/2018 19:55	1.6	69.6
5/16/2018	20:00	5/16/2018 20:00	1.6	74.1
5/16/2018	20:05	5/16/2018 20:05	1.5	68.6
5/16/2018	20:10	5/16/2018 20:10	1.6	57.5
5/16/2018	20:15	5/16/2018 20:15	1.3	62.8
5/16/2018	20:20	5/16/2018 20:20	1.4	67.4
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5/16/2018	20:30	5/16/2018 20:30	1.3	49.3
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5/16/2018	22:25	5/16/2018 22:25	0.6	10.6
5/16/2018	22:30	5/16/2018 22:30	0.9	6.9
5/16/2018	22:35	5/16/2018 22:35	0.6	54.6
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5/17/2018	3:55	5/17/2018 3:55	0.3	292.6
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5/17/2018	8:25	5/17/2018 8:25	0.9	65.7
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5/17/2018	13:00	5/17/2018 13:00	3	8.9
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5/17/2018	13:25	5/17/2018 13:25	3	24.7
5/17/2018	13:30	5/17/2018 13:30	3.4	38.9
5/17/2018	13:35	5/17/2018 13:35	3.3	29.6
5/17/2018	13:40	5/17/2018 13:40	3.5	34.5
5/17/2018	13:45	5/17/2018 13:45	3.8	24.9
5/17/2018	13:50	5/17/2018 13:50	3.4	27
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5/17/2018	15:50	5/17/2018 15:50	3.5	17.5
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5/17/2018	16:15	5/17/2018 16:15	4.8	10
5/17/2018	16:20	5/17/2018 16:20	5.3	6.7
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5/17/2018	18:00	5/17/2018 18:00	4.7	26.1
5/17/2018	18:05	5/17/2018 18:05	4.3	9.8
5/17/2018	18:10	5/17/2018 18:10	5.2	11.5
5/17/2018	18:15	5/17/2018 18:15	4.1	9.1
5/17/2018	18:20	5/17/2018 18:20	4.2	5.4
5/17/2018	18:25	5/17/2018 18:25	3.7	4.9
5/17/2018	18:30	5/17/2018 18:30	3.5	7.7
5/17/2018	18:35	5/17/2018 18:35	3.8	25.9
5/17/2018	18:40	5/17/2018 18:40	4.6	29.3
5/17/2018	18:45	5/17/2018 18:45	4.1	18.8
5/17/2018	18:50	5/17/2018 18:50	3.7	27.3

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5/17/2018	19:00	5/17/2018 19:00	4.8	30
5/17/2018	19:05	5/17/2018 19:05	3.9	19.9
5/17/2018	19:10	5/17/2018 19:10	3.9	16.5
5/17/2018	19:15	5/17/2018 19:15	4.3	22.2
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5/17/2018	19:30	5/17/2018 19:30	4.3	21.2
5/17/2018	19:35	5/17/2018 19:35	4	23.1
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5/17/2018	19:55	5/17/2018 19:55	4.7	28.6
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5/17/2018	20:40	5/17/2018 20:40	2.8	14.4
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5/18/2018	16:15	5/18/2018 16:15	3.7	9.2
5/18/2018	16:20	5/18/2018 16:20	3.3	10.3
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5/18/2018	16:45	5/18/2018 16:45	2.7	21.4
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5/18/2018	17:25	5/18/2018 17:25	3.6	18.9
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5/18/2018	18:00	5/18/2018 18:00	3.8	28.1
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5/18/2018	18:20	5/18/2018 18:20	2.7	37.4

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5/18/2018	18:50	5/18/2018 18:50	2.1	27.5
5/18/2018	18:55	5/18/2018 18:55	2.6	31
5/18/2018	19:00	5/18/2018 19:00	2.8	26.7
5/18/2018	19:05	5/18/2018 19:05	2.4	29.2
5/18/2018	19:10	5/18/2018 19:10	2.8	33.2
5/18/2018	19:15	5/18/2018 19:15	2.8	29.4
5/18/2018	19:20	5/18/2018 19:20	3.2	34.2
5/18/2018	19:25	5/18/2018 19:25	2.9	31.6
5/18/2018	19:30	5/18/2018 19:30	2.4	33.3
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5/18/2018	21:25	5/18/2018 21:25	2.5	65.9
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5/18/2018	21:35	5/18/2018 21:35	3	67.4
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5/18/2018	22:15	5/18/2018 22:15	2.6	57.4

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5/18/2018	23:00	5/18/2018 23:00	2.7	60
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5/18/2018	23:15	5/18/2018 23:15	2.2	60
5/18/2018	23:20	5/18/2018 23:20	2.4	54.3
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5/18/2018	23:55	5/18/2018 23:55	2.5	62.8
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5/19/2018	0:05	5/19/2018 0:05	2.7	51.8
5/19/2018	0:10	5/19/2018 0:10	2.2	42.9
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5/19/2018	11:45	5/19/2018 11:45	2.8	271.1
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5/19/2018	13:35	5/19/2018 13:35	2.3	278.9
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5/19/2018	17:50	5/19/2018 17:50	2.1	309.1

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5/19/2018	18:00	5/19/2018 18:00	2	323.3
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5/19/2018	18:20	5/19/2018 18:20	1.9	333.8
5/19/2018	18:25	5/19/2018 18:25	1.8	334.5
5/19/2018	18:30	5/19/2018 18:30	1.8	338.9
5/19/2018	18:35	5/19/2018 18:35	1.3	335.1
5/19/2018	18:40	5/19/2018 18:40	1.4	345.9
5/19/2018	18:45	5/19/2018 18:45	1.9	359.6
5/19/2018	18:50	5/19/2018 18:50	2	10.3
5/19/2018	18:55	5/19/2018 18:55	1.5	345.7
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5/19/2018	19:30	5/19/2018 19:30	2.8	46.9
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5/19/2018	20:00	5/19/2018 20:00	1.9	51.5
5/19/2018	20:05	5/19/2018 20:05	2	65.8
5/19/2018	20:10	5/19/2018 20:10	2.5	58.5
5/19/2018	20:15	5/19/2018 20:15	2.8	47.7
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5/19/2018	21:45	5/19/2018 21:45	0.8	90.7

5/19/2018	21:50	5/19/2018 21:50	1	94.6
5/19/2018	21:55	5/19/2018 21:55	1.1	81.7
5/19/2018	22:00	5/19/2018 22:00	0.8	86.1
5/19/2018	22:05	5/19/2018 22:05	1.1	87.1
5/19/2018	22:10	5/19/2018 22:10	1.3	97.8
5/19/2018	22:15	5/19/2018 22:15	1.1	99.6
5/19/2018	22:20	5/19/2018 22:20	1.1	145.4
5/19/2018	22:25	5/19/2018 22:25	1.8	184.4
5/19/2018	22:30	5/19/2018 22:30	0.9	191.7
5/19/2018	22:35	5/19/2018 22:35	0.8	121.1
5/19/2018	22:40	5/19/2018 22:40	1.2	49.2
5/19/2018	22:45	5/19/2018 22:45	0.8	40.4
5/19/2018	22:50	5/19/2018 22:50	1.1	54.2
5/19/2018	22:55	5/19/2018 22:55	1.2	55.5
5/19/2018	23:00	5/19/2018 23:00	1.2	62.6
5/19/2018	23:05	5/19/2018 23:05	1.4	63.2
5/19/2018	23:10	5/19/2018 23:10	1.6	52.1
5/19/2018	23:15	5/19/2018 23:15	1.7	59.3
5/19/2018	23:20	5/19/2018 23:20	1.3	38
5/19/2018	23:25	5/19/2018 23:25	1.8	25.3
5/19/2018	23:30	5/19/2018 23:30	1.6	24.7
5/19/2018	23:35	5/19/2018 23:35	1.7	18.8
5/19/2018	23:40	5/19/2018 23:40	1.8	12.5
5/19/2018	23:45	5/19/2018 23:45	2.5	25.7
5/19/2018	23:50	5/19/2018 23:50	2.6	35.3
5/19/2018	23:55	5/19/2018 23:55	2.8	31.6
5/19/2018	0:00	5/19/2018 0:00	1.9	43.4

Message

Sent: 8/9/2018 5:31:41 PM
To: Hoffman, Kathy [KHoffman@sterigenics.com]
CC: Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Nguyen, Phuong [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f07188263d014e06a28762ccf129ce20-PNguyen]; Nwia, Jacqueline [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d299b56bd7ef46709fb7465fd1e15466-JNwia]; Jeffrey Sprague [Jeff.Sprague@Illinois.gov]; King, Steven [Steven.King@Illinois.gov]; Mattison, Kevin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=userff092538]; Shappley, Ned [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5fc7fde372054ab5ac38f24b9072b73d-Shappley, N]; Witt, Jon [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ea00bc6f645b438682026a77a8d4267c-Witt, Jonat]; Smith, Darcie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3ae3c2377efb42879b943db8796ddc05-Smith, Darcie]; Marcus, Danny [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a34c75d25a6243e68733a8ee7e2ddf82-DMarcus]; Ogulei, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c3e66fb31cd74edb89554389d19d6977-DOgulei]; Armitage, Julie [Julie.Armitage@Illinois.gov]; Wayland, Richard [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d69f0a870909402ebd66847003aa6437-Wayland, Chet]; Shelow, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3859abc25e634d418478f3d3ca569c79-Shelow, David]
Subject: RE: Sterigenics call follow-up
Attachments: 2018May10-EtOSamplingPlan_For Sterigenics.pdf; Willowbrook_MetData_0515-0519_For Sterigenics.pdf; 20180703_Sterigenics Monitoring Report_For Sterigenics.pdf; calrpt.pdf; 0182_001.pdf

Hi Kathy—

Attached are the sampling plan, met data, lab reports, and calibration curves. There are a few redactions, related to pre-decision EPA materials. We still owe

---

From: Nam, Ed
Sent: Friday, August 03, 2018 4:52 PM
To: Hoffman, Kathy <KHoffman@sterigenics.com>
Cc: Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Subject: Sterigenics call follow-up

Hi Kathy—

Thanks to you and your team for another very productive conference call. I'm pleased that we were able to get through these technical issues, with just a few follow-ups needs. Here is our understanding of what those follow-ups are:

EPA will provide to Sterigenics:

- Information about method 320, including a list of companies able to perform the test and an explanation of why we are recommending this method.
- EPA's sampling plan used during the cannister sampling in Willowbrook, the lab reports and calibration curves (if possible), and the met data.

Sterigenics will:

- Provide requested stack parameters and building dimensions for modeling.
- Provide a link to information about long-term EtO monitoring in New England.
- Review information about potential use of an IR camera for leak detection.

We will have a follow-up call the week after next. I suggest 9:00 or 10:00am on either Thursday, August 16 or Friday, August 17.

Thanks again.
-Ed

-Edward Nam, PhD
Director, Air and Radiation Division
US EPA, Region 5, Mail code A-18J
77 W. Jackson Blvd.
Chicago, IL 60604-3590
Phone 312-353-2192 nam.ed@epa.gov

Message

Sent: 10/18/2018 10:01:08 PM
To: Tsirigotis, Peter [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d19c179f3ccb4fadb48e3ae85563f132-PTSIRIGO]
Subject: Risk communications

Hi Peter,

I wanted to let you know that I've arranged for a risk communications class for our ethylene oxide team, along with some more intensive coaching for the folks attending the Willowbrook meeting.

Message

Sent: 10/15/2018 8:01:00 PM
To: Burton, Laureen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e9985148e4c44f15ba5b95c8bb16dedf-LBURTON]
Subject: Local government Inquiry - ethylene oxide

Hi Laureen,
I am a contact – but this is not a media inquiry. We are working to respond to residents of Willowbrook, Ill., who are extremely concerned about ethylene oxide emissions from a commercial sterilizer in the area (Willowbrook is a suburb of Chicago). Our National Air Toxics Assessment identified some census tracts in Willowbrook with potential elevated cancer risk from ethylene oxide, and the ATSDR issued a letter on this issue in late August. Residents of the area are extremely concerned -- and as you saw from the inquiry – worried that ethylene oxide could build up in materials indoors.

Providing a link to documents to help you more.

The requestor is Frank Lyons, former Region 5 administrator and an attorney hired by the Village to help with ethylene oxide issues. We would like to respond quickly – tomorrow would be great. If that's not doable, please let me know what is so we can manage expectations.

This is a fact sheet on the ethylene oxide issue that NATA identified. https://www.epa.gov/hazardous-air-pollutants-ethylene-oxide/fact-sheet-epa-taking-steps-address-emissions-ethylene-oxide

This is the web page that includes information about the Willowbrook facility.
https://www.epa.gov/il/sterigenics-willowbrook-facility

From: Burton, Laureen
Sent: Monday, October 15, 2018 3:55 PM
To: Davis, Alison <Davis.Alison@epa.gov>
Subject: FW: Media Inquiry - ethylene oxide

Hello,

I got this inquiry from Lou Witt. Are you the primary contact? I was wondering if you know where the EtO exposure came from? I was told you would like to respond tomorrow - is there a specific time you would need our input (if any)?

Laureen

From: Witt, Lou
Sent: Monday, October 15, 2018 1:24 PM
To: Burton, Laureen <Burton.Laureen@epa.gov>
Subject: Media Inquiry - ethylene oxide

Dear Laureen:

We have an inquiry about whether ethyl oxirene (sp?) can be absorbed by porous materials indoors and if whether there's any guidance to prevent or remove it.

Is there something we can provide – information? Guidance? If need be, would you speak with someone in OAQPS that's writing the response?

They want to include anything from us in their response due tomorrow.

Any and all help is appreciated.

Thanks.

Lou

Lou Witt
Program Analyst
Indoor Environments Division
202-343-9051

Opt-in here to receive email updates on IAQ.

From: Davis, Alison
Sent: Monday, October 15, 2018 12:45 PM
To: Witt, Lou <Witt.Lou@epa.gov>
Cc: Bremer, Kristen <Bremer.Kristen@epa.gov>
Subject: Follow up to our phone call - ethylene oxide

Hi Lou,

This is the inquiry we received from Frank Lyons, the former R5 Administrator. Mr. Lyons is an attorney for the Village of Willowbrook. **We would like to respond to this as quickly as possible.** Please let us know if there are technical experts our technical experts should talk with …

Here's the incoming:

The Village Administrator for Willowbrook, received a call from Tom Cuculich, the DuPage County Administrator. He advised that the county is receiving calls from residents and property owners asking whether there will be special waste collection services as a result of the EtO exposure. Apparently, there is concern among some that EtO accumulates in drywall, carpet, and other fibrous materials. As a result, some residents and property owners are apparently planning to remove those types of materials from their homes and replacing them, due to concerns over EtO accumulation in the materials. The county administrator stated that he is looking for guidance on whether this is a valid concern, and how the county may respond to these inquiries. He would like to post something on the county website that addresses this issue.

Thanks.

Alison Davis
Acting Director
Policy Analysis & Communications Staff

US EPA, Office of Air Quality Planning & Standards
Research Triangle Park, NC 27711
Desk: 919-541-7587
Mobile: Personal Privacy / Ex. 6

Message

From: Davis.Alison@epa.gov [Davis.Alison@epa.gov]
Sent: 10/16/2018 5:29:16 PM
To: Kelley, Jeff [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e154fa5a5f744c70aa3da58e3f87aabe-JKelley]
CC: Grantham, Nancy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=12a3c2ed7158417fb0bb1b1b72a8cfb0-Grantham, Nancy]; Bremer, Kristen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b7ad6f4a11064ef08cb03aec9dc8e892-KBREMER]
Subject: Re: A Note from a Concerned Citizen

We have something too - can in through a web comment

Alison Davis
Acting Director
Policy Analysis & Communications Staff
US EPA, Office of Air Quality Planning & Standards
Research Triangle Park, NC 27711
Desk: 919-541-7587
Mobile: Personal Privacy / Ex. 6

Sent from my iPhone

On Oct 16, 2018, at 1:19 PM, Kelley, Jeff <kelley.jeff@epa.gov> wrote:

> This is the only one Cathy has forwarded to me, so I don't think there's an organized effort. I know our Air folks have received a handful of calls and emails, as well.
>
> ---
> ***Jeff Kelley***
> *Director, Office of External Communications*
> *U.S. EPA Region 5*
> *ph: 312-353-1159*
>
> ---
>
> **From:** Grantham, Nancy
> **Sent:** Tuesday, October 16, 2018 12:18 PM
> **To:** Kelley, Jeff <kelley.jeff@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>
> **Subject:** RE: A Note from a Concerned Citizen
>
> What is the volume?
>
> **Nancy Grantham**
> **Office of Public Affairs**
> **US Environmental Protection Agency**
> **202-564-6879 (desk)**
> Personal Privacy / Ex. 6 **mobile)**

From: Kelley, Jeff
Sent: Tuesday, October 16, 2018 12:15 PM
To: Davis, Alison <Davis.Alison@epa.gov>; Grantham, Nancy <Grantham.Nancy@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>
Subject: FW: A Note from a Concerned Citizen

Thoughts on how to respond to incoming messages like this?

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

From: Stepp, Cathy
Sent: Tuesday, October 16, 2018 11:10 AM
To: Kelley, Jeff <kelley.jeff@epa.gov>
Cc: Thiede, Kurt <thiede.kurt@epa.gov>; Payne, James <payne.james@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Subject: Fwd: A Note from a Concerned Citizen

Jeff, could you please forward this to the appropriate person in headquarters for a timely response? Thank you

Sent from my iPhone

Begin forwarded message:

> **From:** Personal Privacy / Ex. 6
> **Date:** October 16, 2018 at 11:04:21 AM CDT
> **To:** stepp.cathy@epa.gov, wheeler.andrew@epa.gov
> **Subject: A Note from a Concerned Citizen**
>
> Hello,
>
> I am a parent of 3 children under the age of 5. We live within 1 mile of Sterigenics in Willowbrook, IL. A carcinogen being pumped into the air we breathe is completely unacceptable. Sterigenics needs to be shut down NOW! My children's futures are a stake, along with the futures of many other children in the area. Please, put health before politics. Please, end the madness. Please, put our children first. Please, STOP STERIGENICS!
>
> Thank you,
>
> Personal Privacy / Ex. 6

Message

Sent: 10/18/2018 9:42:02 PM
To: Bremer, Kristen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b7ad6f4a11064ef08cb03aec9dc8e892-KBREMER]
Subject: RE: Short response

Deliberative Process / Ex. 5

From: Bremer, Kristen
Sent: Thursday, October 18, 2018 5:23 PM
To: Davis, Alison <Davis.Alison@epa.gov>
Subject: Short response

Deliberative Process / Ex. 5

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: Personal Privacy / Ex. 6

Appointment

From: Perez, Idalia [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=03b7a08fdfbe4934911f17550d78491d-IPEREZ]
Sent: 8/9/2018 9:59:27 PM
To: Perez, Idalia [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=03b7a08fdfbe4934911f17550d78491d-IPEREZ]; Koerber, Mike [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9c513901d4fd49f9ab101a6f7a7a863e-Koerber, Mike]; Whitlow, Jeff [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=cc115821bfa644b48ed2eea8fb210536-Whitlow, Jeff]; Smith, Darcie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3ae3c2377efb42879b943db8796ddc05-Smith, Darcie]; Sasser, Erika [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=477638fe84004800bfdf8e62fe3cafc8-ESASSER]; Jones, Rhea [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8d213054092e4312bf031a52d13aafb8-RJONES02]; Rimer, Kelly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=123a21a46d0e4e53a590798cdcc3fb47-KRIMER]; Shaw, Betsy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=31ca1476a7674825a131cb2c0d6c88c8-BShaw03]; Air Division Directors and Deputies [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1b532f2f8468410ca085dc3d6c7d2e4d-Air Division Directors and Deputies]; Wortman, Eric [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5a6a4541680f4c89adaf1198de1925c4-Wortman, Eric]; Davidson, Ken [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d2e266ba15be4fa3b51faa9c7ad27d02-KDAVID04]; Fiedler, Kerri [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d98346b4d0ad4ccb87c77cef03365b42-Fiedler, Kerri]; Olson, Kyle [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d8f6bca1f37c4780ab419dab7b1d65ff-Olson, Kyle]; Matichuk, Rebecca [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=16f8c962b98f4de08e63d15cc4bd1b26-Matichuk, Rebecca]; Louis, Egide [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=da5fb376450444909725aaf789576191-Louis, Egide]; Rinck, Todd [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a7626516c3a4462c9e4fa00686426e57-Rinck, Robert]; Worley, Gregg [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f2f97eaf7d46484f8ed97dffbb43f1ac-Worley, Gregg]; Harris-Young, Dawn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1352e37302cf4eb78a64c69a108b46e5-Young, Dawn]; Shappley, Ned [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5fc7fde372054ab5ac38f24b9072b73d-Shappley, N]; Wayland, Richard [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d69f0a870909402ebd66847003aa6437-Wayland, Chet]; Mylott, Richard [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=16543f1a0e1a4c4dafe0611a15c85705-Mylott, Richard]; Palma, Ted [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f7bef4a695c944f089bf3e14f199f8aa-Palma, Ted]; Lessard, Patrick [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=936faef361044e1087b6ca18d92b4cca-Lessard, Pa]; Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]; Lancey, Susan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=bf0bb7c5156047b387ceeb5ff51cf196-Lancey, Susan]; Bellizzi, Carol [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=815f6f0ceb2c42b69b7130bc5fe82c23-Bellizzi, Carol]; Chow, Alice [/o=ExchangeLabs/ou=Exchange Administrative Group

(FYDIBOHF23SPDLT)/cn=Recipients/cn=b446a8f46f6447ee8294845b0a066623-Achow]; Sieffert, Margaret [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]; Doolan, Stephanie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c29497d879b44a6da61be100cdb7c6c2-DOOLAN, STEPHANIE]; Glass, Geoffrey [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1ee3c5cd15504e5aa8660fcf60d2e04d-GGLASS]

CC: Verhalen, Frances [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=da20b77d29d744a3aaec0cf67c7718ba-Verhalen, Frances]; Madden, Joshua [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dfcb5e16e56a4858b75551a6326a0fb0-Madden, Jos]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Cain, Alexis [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]

Subject: Special Purpose Call: NATA - Next steps on EtO facilities
Attachments: Copy of Facility checklist_Aug13.edit1.xlsx
Location: Line Personal Privacy / Ex. 6

Start: 8/13/2018 4:00:00 PM
End: 8/13/2018 5:00:00 PM
Show Time As: Busy

Update: Adding materials and short agenda.

Agenda

- Updated list
- hybrid strategy elements
- NATA rollout schedule

Message

From: Rimer, Kelly [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=123A21A46D0E4E53A590798CDCC3FB47-KRIMER]
Sent: 8/22/2018 1:51:14 PM
To: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: Re: R5 web language

On my way
Got held up

> On Aug 22, 2018, at 9:44 AM, Davis, Alison <Davis.Alison@epa.gov> wrote:
>
> You did? I don't see them
>
> -----Original Message-----
> From: Rimer, Kelly
> Sent: Wednesday, August 22, 2018 9:41 AM
> To: Davis, Alison <Davis.Alison@epa.gov>
> Subject: R5 web language
>
> I left Amy's comments on the sterigenics web site on your chair.
>
> Assume you will get to R5?
>

Message

From: Langdon, Robin [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DFD5FBD46A7494C82E49AEB435BFA8D-LANGDON, ROBIN]
Sent: 6/25/2018 8:00:07 PM
To: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: FW: Monitoring Options for R5
Attachments: Ethylene Oxide - Monitoring Options 06_25_2018.docx

Robin Langdon
USEPA
Office of Air Quality Planning & Standards
Durham, NC 27711
919.541.5695
langdon.robin@epa.gov

From: Langdon, Robin
Sent: Monday, June 25, 2018 3:59 PM
To: Wayland, Richard <Wayland.Richard@epa.gov>; Koerber, Mike <Koerber.Mike@epa.gov>
Cc: Sasser, Erika <Sasser.Erika@epa.gov>; Shappley, Ned <Shappley.Ned@epa.gov>; Jones, Rhea <Jones.Rhea@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>
Subject: Monitoring Options for R5

Chet and Mike,

Attached please find an updated monitoring options document. We made some additional modifications to the version Ned prepared on Friday, and Ned and Jason Dewees have reviewed the version with these modifications.

Please let us know if you have any questions.

Thank you to everyone for their efforts to quickly prepare the attached document.
Robin

Robin Langdon
USEPA
Office of Air Quality Planning & Standards
Durham, NC 27711
919.541.5695
langdon.robin@epa.gov

Message

From: DeLuca, Isabel [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=0B021C30CBEE4637A7C7CA683E5E044A-IDELUCA]
Sent: 8/17/2018 9:22:24 PM
To: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: press release
Attachments: 20180809-sterigenic_news_release-v2.3.OAQPS.ID.docx

Deliberative Process / Ex. 5

Isabel DeLuca
Office of Air and Radiation, US EPA
(202) 343-9247

Message

From: Mckelvey, Laura [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F3A2C5F041A442EA931DDB3D039236FF-LMCKELVE]
Sent: 10/18/2018 2:02:09 PM
To: kim.biggs@illinois.gov
CC: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]; Kelley, Jeff [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e154fa5a5f744c70aa3da58e3f87aabe-JKelley]
Subject: FW: First planning call for the Willowbrook community meeting Conference Line/Code / Ex. 6
Attachments: straw proposed agenda for Willowbrook community meeting101718.docx

Hi Kim,

Thanks for agreeing to have someone on the call. Here's the information we will be working off of today.

Thanks
Laura

From: Mckelvey, Laura
Sent: Wednesday, October 17, 2018 4:56 PM
To: 'thalik@willowbrook.il.us' <thalik@willowbrook.il.us>; Rimer, Kelly <Rimer.Kelly@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>; Kelley, Jeff <kelley.jeff@epa.gov>; Holly Wilson <Wilson.Holly@epa.gov>; Cortelyou-Lee, Jan <Cortelyou-Lee.Jan@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Singer, Joshua <Singer.Joshua@epa.gov>; Deamer, Eileen <deamer.eileen@epa.gov>; 'Sylvia Mcivor' <smcivor@darienil.gov>; 'Lauren Kaeseberg' <laurenkaeseberg@gmail.com>; 'Srikant Rao' <mslrao71@gmail.com>; Steve Leopoldo <steve.leopoldo@gmail.com>; Urszula Tanouye <urszula.tanouye@gmail.com>; Law,Bruce <blaw@hinsdale86.org>; 'Victor Simon' <vsimon@gower62.com>; 'Evan Walter' <EWalter@burr-ridge.gov>; Mayor Mickey <Mickey@mayormickey.com>; kweaver@darienil.gov; Douglas Pollock <DPOLLOCK@BURR-RIDGE.GOV>; 'Bvana@darienil.gov' <Bvana@darienil.gov>
Cc: Smith, Darcie <Smith.Darcie@epa.gov>; Mickey Straub <mickey@samusa.com>; slymcivor23@gmail.com
Subject: RE: First planning call for the Willowbrook community meeting & Conference Line/Code / Ex. 6

Hi folks,

Thanks for agreeing to participate on the first planning call tomorrow.

In order to make sure we have some structure on tomorrow's planning call I want to send out the following proposed agenda for today's call:

1) Lock down the location and time for the meeting
2) Clarify goals and expectations for the meeting
3) Initiate the discussion for the structure and agenda for the meeting
4) Discuss the speakers/experts
5) Determine when to meeting again to continue planning

I am also to attaching a the draft agenda for the community meeting as a straw to start the conversation and can be deleted or modified. So that we are meeting the communities your needs.

I look forward to the conversation tomorrow.

Thanks

Laura

-----Original Appointment-----
From: Mckelvey, Laura
Sent: Thursday, October 11, 2018 11:36 AM
To: Mckelvey, Laura; thalik@willowbrook.il.us; Rimer, Kelly; Davis, Alison; Kelley, Jeff; Holly Wilson; Cortelyou-Lee, Jan; Siegel, Kathryn; Singer, Joshua; Deamer, Eileen; Sylvia Mcivor; 'Lauren Kaeseberg'; Srikant Rao; Steve Leopoldo; Urszula Tanouye; Law,Bruce; Victor Simon; Evan Walter; Mayor Mickey; kweaver@darienil.gov; Douglas Pollock; Bvana@darienil.gov
Cc: Smith, Darcie; Mickey Straub; slymcivor23@gmail.com
Subject: First planning call for the Willowbrook community meeting Conference Line/Code / Ex. 6
When: Thursday, October 18, 2018 11:00 AM-12:00 PM (UTC-05:00) Eastern Time (US & Canada).
Where: RTP-C300C-Max50/RTP-Bldg-C

Message

From: Langdon, Robin [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DFD5FBD46A7494C82E49AEB435BFA8D-LANGDON, ROBIN]
Sent: 6/25/2018 4:44:49 PM
To: Palma, Ted [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f7bef4a695c944f089bf3e14f199f8aa-Palma, Ted]; Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]; Shelow, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3859abc25e634d418478f3d3ca569c79-Shelow, David]; Rimer, Kelly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=123a21a46d0e4e53a590798cdcc3fb47-KRIMER]; Sasser, Erika [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=477638fe84004800bfdf8e62fe3cafc8-ESASSER]; Shappley, Ned [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5fc7fde372054ab5ac38f24b9072b73d-Shappley, N]
CC: Smith, Darcie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3ae3c2377efb42879b943db8796ddc05-Smith, Darcie]
Subject: RE: Sterigenics

Hi Ted,

I called Margaret in response to the email you forwarded.

Thanks,
Robin

Robin Langdon
USEPA
Office of Air Quality Planning & Standards
Durham, NC 27711
919.541.5695
langdon.robin@epa.gov

From: Palma, Ted
Sent: Monday, June 25, 2018 8:42 AM
To: Davis, Alison <Davis.Alison@epa.gov>; Shelow, David <Shelow.David@epa.gov>; Langdon, Robin <Langdon.Robin@epa.gov>; Rimer, Kelly <Rimer.Kelly@epa.gov>; Sasser, Erika <Sasser.Erika@epa.gov>; Shappley, Ned <Shappley.Ned@epa.gov>
Cc: Smith, Darcie <Smith.Darcie@epa.gov>
Subject: Fw: Sterigenics

please advise on what role we should play in this moving forward

Ted

Ted Palma
USEPA
OAQPS/HEID/ATAG
MD C539-02
RTP, NC 27711

From: Sieffert, Margaret
Sent: Monday, June 25, 2018 8:33 AM
To: Smith, Darcie; Palma, Ted
Subject: Sterigenics

There is a call/meeting being set up with Sterigenics for either Wednesday or Thursday of this week. We are being asked to come up with questions to ask during the call/meeting. Please let us know if you have any questions you think we should be asking. They are supposedly coming up with their own questions as well. Not sure if there will be time to share the questions before hand but I will try to share them with you if we get any.

-Margaret

Message

From: DeLuca, Isabel [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=0B021C30CBEE4637A7C7CA683E5E044A-IDELUCA]
Sent: 9/21/2018 1:21:35 PM
To: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: RE: MEDIA INQUIRY: Queensbury facility

I apologize, this came in late on Wednesday and got lost in the pile by Thursday morning.

I have some suggested edits below in redline(take or leave). Please take a look, and once we're ready I should flag as an FYI for Clint.

From: Davis, Alison
Sent: Thursday, September 20, 2018 5:57 PM
To: DeLuca, Isabel <DeLuca.Isabel@epa.gov>
Subject: FW: MEDIA INQUIRY: Queensbury facility

Did you all sign off on this? I missed this earlier

From: Kluesner, Dave
Sent: Thursday, September 20, 2018 8:49 AM
To: regionalpress <regionalpress@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; DeLuca, Isabel <DeLuca.Isabel@epa.gov>
Cc: Mears, Mary <Mears.Mary@epa.gov>; Covington, Tayler <covington.tayler@epa.gov>
Subject: MEDIA INQUIRY: Queensbury facility

Alison, we confirmed that you indeed have the correct address. If we can get OAR to sign off this, that would be great. Thanks all.

David W. Kluesner

U.S. Environmental Protection Agency, Region 2
Deputy Director, Public Affairs
290 Broadway, 26th Floor
New York, NY 10007
212.637.3653 (Office)
347.330.9439 (Cell)

From: Davis, Alison
Sent: Wednesday, September 19, 2018 6:04 PM
To: Grantham, Nancy <Grantham.Nancy@epa.gov>; Mears, Mary <Mears.Mary@epa.gov>
Cc: Bremer, Kristen <Bremer.Kristen@epa.gov>; DeLuca, Isabel <DeLuca.Isabel@epa.gov>
Subject: Queensbury facility - OAQPS comments

Hi all –

Deliberative Process / Ex. 5

Nancy – this draft is based on OAPQS comments and does not include review from OAR.
Thanks.
-Alison

STATUS: OPEN

INQUIRY RECEIVED ON: September 17

PAD CONTACT: Mary Mears, Tayler Covington

REPORTER: Larry Rulison, Albany Times-Union; (518) 454-5504, lrulison@TimesUnion.com

QUESTIONS FROM THE REPORTER: Do you know if the EPA has any concerns over the emissions of ethylene oxide at Sterigenics International in Glens Falls?

There was a recent report by HHS that the ethylene oxide levels in Willowbook Ill by Sterigenics were dangerous. I wanted to let our readers know if they should be worried about the Glens Falls location…

https://www3.epa.gov/enviro/facts/tri/ef-facilities/#/Facility/12801GRFFT27PAR/STERIGENICS%20US%20LLC-QUEENSBURY%20NY%20FACILITY

PROPOSED RESPONSE:

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Message

From: Nam, Ed [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A2653F1DDD59470688BA557DD84D9690-NAM, ED]
Sent: 8/10/2018 4:24:20 PM
To: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: RE: Sterigenics next steps

Sorry Alison,

I moved it to 9:30 just before I left last night, but it might not have gotten to you. Sorry about the confusion.

-Ed

From: Davis, Alison
Sent: Friday, August 10, 2018 9:07 AM
To: Nam, Ed <nam.ed@epa.gov>
Subject: RE: Sterigenics next steps

Has this moved? Thanks

-----Original Appointment-----
From: Nam, Ed
Sent: Thursday, August 09, 2018 7:49 PM
To: Nam, Ed; Siegel, Kathryn; Furey, Eileen; Koerber, Mike; Rimer, Kelly; Sasser, Erika; Cain, Alexis
Cc: Davis, Alison; Bremer, Kristen
Subject: Fwd: Sterigenics next steps
When: Friday, August 10, 2018 9:00 AM-10:00 AM (UTC-06:00) Central Time (US & Canada).
Where: conference line: Personal Privacy / Ex. 6

Sent from my iPhone

Begin forwarded message:

> **From:** "Nam, Ed" <nam.ed@epa.gov>
> **To:** "Siegel, Kathryn" <siegel.kathryn@epa.gov>, "Furey, Eileen" <furey.eileen@epa.gov>, "Koerber, Mike" <Koerber.Mike@epa.gov>, "Rimer, Kelly" <Rimer.Kelly@epa.gov>, "Sasser, Erika" <Sasser.Erika@epa.gov>, "Cain, Alexis" <cain.alexis@epa.gov>
> **Subject: Sterigenics next steps**
>
> Delaying meeting a bit.
> Thanks
> -Ed
>
> Can we meet tomorrow to discuss some recent events?
> Thanks,
> -Ed

Message

From: Kelley, Jeff [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E154FA5A5F744C70AA3DA58E3F87AABE-JKELLEY]
Sent: 6/22/2018 2:00:32 PM
To: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: Re: Sieffert, Margaret has shared 'Sterigenics'

Change in plans ... no news release today. Call me if you want to discuss.

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

On Jun 22, 2018, at 8:59 AM, Davis, Alison <Davis.Alison@epa.gov> wrote:

> Jeff – is the latest version on Sharepoint – we should grab it from there? Thanks.
>
> **From:** Kelley, Jeff
> **Sent:** Friday, June 22, 2018 9:41 AM
> **To:** Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Damico, Genevieve <damico.genevieve@epa.gov>; Beckmann, Ronna Erin <beckmann.ronna@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Olson, Erik <olson.erik@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>; Sasser, Erika <Sasser.Erika@epa.gov>; Palma, Ted <Palma.Ted@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>; Newton, Cheryl <Newton.Cheryl@epa.gov>
> **Subject:** RE: Sieffert, Margaret has shared 'Sterigenics'
>
> I'd like any suggested edits on the news release to come directly to me via email, not in Sharepoint.
>
> ---
> ***Jeff Kelley***
> *Director, Office of External Communications*
> *U.S. EPA Region 5*
> *ph: 312-353-1159*
>
> **From:** Sieffert, Margaret
> **Sent:** Friday, June 22, 2018 8:33 AM
> **To:** Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Damico, Genevieve <damico.genevieve@epa.gov>; Beckmann, Ronna Erin <beckmann.ronna@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Olson, Erik <olson.erik@epa.gov>; Kelley, Jeff <kelley.jeff@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>; Sasser, Erika <Sasser.Erika@epa.gov>; Palma, Ted <Palma.Ted@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>; Newton, Cheryl <Newton.Cheryl@epa.gov>
> **Subject:** RE: Sieffert, Margaret has shared 'Sterigenics'

I see that people are still editing the talking points document from my onedrive. I don't want there to be two versions as I saved a version from my one drive to the folder. Could people please save their edits and then I will move the most recent version to the folder linked below.

Thanks, Margaret

From: Sieffert, Margaret [mailto:no-reply@sharepointonline.com]
Sent: Friday, June 22, 2018 8:13 AM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Damico, Genevieve <damico.genevieve@epa.gov>; Beckmann, Ronna Erin <beckmann.ronna@epa.gov>; Nwia, Jacqueline <nwia.jacqueline@epa.gov>; Bollweg, George <bollweg.george@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Olson, Erik <olson.erik@epa.gov>; Kelley, Jeff <kelley.jeff@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>; Sasser, Erika <Sasser.Erika@epa.gov>; Palma, Ted <Palma.Ted@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>; Payne, James <payne.james@epa.gov>; Thiede, Kurt <thiede.kurt@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: Sieffert, Margaret has shared 'Sterigenics'

Here is a folder to put all documents people are reviewing regarding Sterigenics. Katie and/or I will start to copy documents into this folder after it is created. Others can also add documents. Please let Katie or I know if others need to be added.

-Margaret

Go to Sterigenics

<image001.png> Get the SharePoint mobile app! <image002.png> <image003.png> <image004.png>

Message

From: Grantham, Nancy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=12A3C2ED7158417FB0BB1B1B72A8CFB0-GRANTHAM, NANCY]
Sent: 9/26/2018 3:00:39 PM
To: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: RE: The urgent Sterigenics question in DuPage: How much cancer risk? - Chicago Tribune

Can you call me asap thanks ng

Nancy Grantham
Office of Public Affairs
US Environmental Protection Agency
202-564-6879 (desk)
Personal Privacy / Ex. 6

From: Davis, Alison
Sent: Wednesday, September 26, 2018 9:51 AM
To: Grantham, Nancy <Grantham.Nancy@epa.gov>
Cc: DeLuca, Isabel <DeLuca.Isabel@epa.gov>
Subject: Re: The urgent Sterigenics question in DuPage: How much cancer risk? - Chicago Tribune

Hi Nancy - please replace Kelly Rimer with Kristen Bremer on these emails. Kelly is technical staff. Thanks

Alison Davis
Acting Director
Policy Analysis & Communications Staff
US EPA, Office of Air Quality Planning & Standards
Research Triangle Park, NC 27711
Desk: 919-541-7587
Mobile: Personal Privacy / Ex. 6

Sent from my iPhone

On Sep 26, 2018, at 8:25 AM, Grantham, Nancy <Grantham.Nancy@epa.gov> wrote:

Nancy Grantham
Office of Public Affairs
US Environmental Protection Agency
202-564-6879 (desk)
Personal Privacy / Ex. 6

From: Kelley, Jeff
Sent: Wednesday, September 26, 2018 8:23 AM
To: Stepp, Cathy <stepp.cathy@epa.gov>; Thiede, Kurt <thiede.kurt@epa.gov>; Payne, James <payne.james@epa.gov>
Cc: Nam, Ed <nam.ed@epa.gov>; Rowan, Anne <rowan.anne@epa.gov>; Singer, Joshua

http://www.chicagotribune.com/news/opinion/editorials/ct-edit-sterigenics-cancer-risk-willowbrook-20180925-story.html

The urgent Sterigenics question in DuPage: How much cancer risk?

Editorial Board

"Cancer Alley." That's what Lousianans call a stretch of the Mississippi River Valley between Baton Rouge and New Orleans where chemical plants have been spewing pollution for years. Near one of those plants, the risk for developing cancer from toxic air pollution is the highest in the country, according to the U.S. Environmental Protection Agency.

Does the western Chicago suburb of Willowbrook have its own cancer peril? Residents in that DuPage County community and in neighboring suburbs want to know. They deserve to know, as quickly as possible.

The focus of residents' concern is Sterigenics International, a global company that sterilizes medical instruments, pharmaceutical drugs and food, the Tribune's Michael Hawthorne has reported. Willowbrook is one of 16 cities in which Sterigenics operates. The work the company does involves use of ethylene oxide, a chemical that has been on the federal government's list of carcinogens since 1985.

The U.S. EPA regularly assesses cancer risks from air pollution. It maintains a National Air Toxics Assessment, which red flags areas in the country where more investigation into the impact of air toxins is warranted. Most of the census tracts flagged in the assessment are in Louisiana's "Cancer Alley." Seven of them are in DuPage County, near the Sterigenics plant.

That understandably worries people in southeast DuPage County and nearby areas. More than 19,200 people live within a mile radius of the plant. Four schools and a day care center also are located within that radius. Some people have organized protests outside the plant and demanded it move if it continues to release ethylene oxide into the air. "Even if they stop tomorrow, there are going to be repercussions for our community for

years, if not decades," T.J. Kelleher, who lives within a mile of the plant, told Hawthorne. His wife died of pancreatic cancer in February.

Officials at Sterigenics say that in July they installed state-of-the-art emissions control equipment that will reduce ethylene oxide emissions by 90 percent. And on its website, the company says the body naturally produces ethylene oxide: "There is far more (ethylene oxide) internally produced within our own bodies than the risk level stated in the EPA's … risk assessment."

What's at issue, however, are amounts of ethylene oxide in the air that could prove harmful — not trace amounts generated within the human body. In May, U.S. EPA officials collected air samples in southeast DuPage County communities. Based on that data, federal health officials concluded that the cancer risk from breathing in ethylene oxide in the area could be "up to 6,400 per million, or more than 6 cases of cancer for every 1,000 people," Hawthorne wrote.

Peter Orris, an occupational and environmental medicine researcher at the University of Illinois at Chicago, called that statistic "just staggering."

Federal health officials, the Illinois attorney general's office and U.S. Sens. Dick Durbin and Tammy Duckworth say there's a clear need for much more robust testing around the plant: a long-term air monitoring effort in residential areas by the U.S. EPA and Sterigenics. That's a reasonable request, and one that should be acted on as urgently as possible. Here's why:

The first must-take step here is to understand the scope and intensity of the risk over time. Yet the testing done in May gave only a snapshot of the problem. Long-term air monitoring would provide a much more accurate picture, and it would tell residents of surrounding communities whether the new equipment Sterigenics installed in July has actually made a difference. That information would help regulators and other public officials decide whether to take other actions. DuPage County Board Chairman Dan Cronin and state Sen. John Curran have called for revoking the company's current state permit to operate.

The Sterigenics plant isn't isolated in some vast industrial tract. It's next to homes, parks and schools — places where children learn, play and live, communities that people have been rooted in for years. Kelleher, of Darien, told Hawthorne, "To think the very place my wife loved, the place where we raised our children, might have killed her is devastating."

Kelleher and other residents need a clearer picture of what they're dealing with. That's not a big ask. Given the potential risks, it's mandatory.

READ MORE

Trump, Rauner have the power to shut down a toxic Willowbrook plant. Will they use it? »

Rauner EPA withholds Sterigenics records from attorney general until local Republicans intervene »

Residents outraged by EPA pollution report call for Willowbrook Sterigenics plant to close »

Join the discussion on Twitter @Trib_Ed_Board and on Facebook.

Submit a letter to the editor here or email letters@chicagotribune.com.

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

Message

From: Grantham, Nancy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=12A3C2ED7158417FB0BB1B1B72A8CFB0-GRANTHAM, NANCY]
Sent: 8/8/2018 4:03:38 PM
To: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: RE: any update from ETO meeting with region 5 RA and Bill Wehrum yesterday? thanks ng

Great .. that is what I meant .. the region and atsdr

Nancy Grantham
Office of Public Affairs
US Environmental Protection Agency
202-564-6879 (desk)
Personal Privacy / Ex. 6

From: Davis, Alison
Sent: Wednesday, August 08, 2018 12:02 PM
To: Grantham, Nancy <Grantham.Nancy@epa.gov>
Subject: RE: any update from ETO meeting with region 5 RA and Bill Wehrum yesterday? thanks ng

We did not meet with Bill yesterday – just the region. tied up in meetings now. Call you this p.m.

From: Grantham, Nancy
Sent: Wednesday, August 08, 2018 10:57 AM
To: Davis, Alison <Davis.Alison@epa.gov>
Subject: RE: any update from ETO meeting with region 5 RA and Bill Wehrum yesterday? thanks ng

Can you call me when convenient re: call with ATSDR yesterday? thanks ng

Nancy Grantham
Office of Public Affairs
US Environmental Protection Agency
202-564-6879 (desk)
Personal Privacy / Ex. 6

From: Davis, Alison
Sent: Friday, August 03, 2018 11:35 AM
To: Grantham, Nancy <Grantham.Nancy@epa.gov>; Kelley, Jeff <kelley.jeff@epa.gov>; Rowan, Anne <rowan.anne@epa.gov>
Cc: DeLuca, Isabel <DeLuca.Isabel@epa.gov>
Subject: RE: any update from ETO meeting with region 5 RA and Bill Wehrum yesterday? thanks ng

I haven't heard anything here

From: Grantham, Nancy
Sent: Friday, August 03, 2018 7:19 AM
To: Kelley, Jeff <kelley.jeff@epa.gov>; Rowan, Anne <rowan.anne@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>
Subject: RE: any update from ETO meeting with region 5 RA and Bill Wehrum yesterday? thanks ng

Specifically related to the ATSDR letter and sterigenics? Thanks ng

Nancy Grantham
Office of Public Affairs
US Environmental Protection Agency
202-564-6879 (desk)
Personal Privacy / Ex. 6

From: Grantham, Nancy
Sent: Friday, August 03, 2018 7:18 AM
To: Kelley, Jeff <kelley.jeff@epa.gov>; Rowan, Anne <rowan.anne@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>
Subject: any update from ETO meeting with region 5 RA and Bill Wehrum yesterday? thanks ng

Nancy Grantham
Office of Public Affairs
US Environmental Protection Agency
202-564-6879 (desk)
Personal Privacy / Ex. 6

Message

From: Siegel, Kathryn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F57A52EFEAD9497CB582B11B8C85F09F-KSIEGE02]
Sent: 10/4/2018 4:00:28 PM
To: Rimer, Kelly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=123a21a46d0e4e53a590798cdcc3fb47-KRIMER]; Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: FW: Questions for the EPA
Attachments: ATT00001.txt

Here is the original request

From: Personal Email / Ex. 6
Sent: Tuesday, September 18, 2018 3:40 PM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>
Cc: Personal Email / Ex. 6
Personal Email / Ex. 6
Subject: Questions for the EPA

Good afternoon, Personal Email / Ex. 6 ,

As I am sure you are aware, the Village of Willowbrook has compiled a list of questions related to Ethylene Oxide and Sterigenics that we have received from concerned residents. I have included them below. I apologize if you have already received them from one of our consultants, but getting answers to these is one of our top priorities during this time. If you have any questions, please feel free to contact me personally.

1. Can EtO get into the water supply?
2. How will the long-term health problems associated with the release of EtO be monitored?
3. How long has the emissions problem been going on?
4. How long until the air quality returns to normal?
5. The National Air Toxic Assessment in 2014 identified DuPage county as having two of the worst census tracks in total cancer risk; why are we just finding out about this now?
6. Why has there been no permanent air monitoring put in place to measure emissions near the schools and daycare?
7. Why is there not more being done to find an alternative to EtO?
8. Is there a plan for long term monitoring?
9. What is the radius of the two highly concentrated EtO emanating from the plants?
10. How long does EtO linger in the air and how does it leave? Does it disperse, fall to the ground, disintegrate, how does the concentration leave the air and how quickly?
11. What is the lingering effect of the much higher release of the EtO from 98 and prior?
12. Our family currently lives in the area shown in color code as having the highest emission of toxicity from ethylene oxide, but I believe that is only as current as 2014?
13. How did the EPA/other federal government agency originally become aware of the Sterigenics EtO emissions problem?
14. Where were the samples taken?
15. If the EPA becomes defunded, will this be followed up at the state or local level?
16. Has food sold or served at Target, Portillo's, or any other nearby establishment been determined to be contaminated by the EtO from Sterigenics?

17. What is the dispersion rate of EtO/how long does it typically linger in the area?

Jeffrey Monteleone
Assistant Village Administrator
Village of Willowbrook
835 Midway Drive
Willowbrook, IL 60527

Office:
E-mail: Personal Email / Ex. 6
Web:

Message

From: Grantham, Nancy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=12A3C2ED7158417FB0BB1B1B72A8CFB0-GRANTHAM, NANCY]
Sent: 8/22/2018 3:03:14 PM
To: Regional Public Affairs Directors [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=df2f9cc7475345c9897ecec6e434647d-PADs]
CC: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]; DeLuca, Isabel [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0b021c30cbee4637a7c7ca683e5e044a-IDELUCA]; Grantham, Nancy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=12a3c2ed7158417fb0bb1b1b72a8cfb0-Grantham, Nancy]; Richardson, RobinH [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2fa5c9eb65dc497c81a8dc9ccdb1ffa7-Richardson, RobinH]; Haman, Patricia [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0ebb27cd881d41b19a30a491dc3f3f57-phaman]; Thundiyil, Karen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=25cfc85adc76406db1ddf8a5232eb5e8-KTHUNDIY]; Davis, Matthew [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=84111ec08c504b6baae0510b2d2ce46a-Davis, Matthew]; Bowles, Jack [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=78e63acc248f41328768db82d95464c3-JBOWLES]; Millett, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c067caa6c93544f78c26ab08cc567d27-Millett, John]
Subject: FW: NATA Data Materials -- now with Spanish fact sheets and Willowbook, Il Sterigenics desk statement
Attachments: 2014 NATA Overview Fact Sheet..pdf; Ethylene Oxide Fact Sheet.Final.8.21.18.pdf; Draft Desk Statement quick review.docx; 082218 2014 NATA Overview Fact Sheet Spanish.docx; 082218 Ethylene Oxide Fact Sheet.Final.8.21.18 Spanish.docx; 20180821-Sterigenics_desk_statement- OAR.DOCX

All –

Attached are the following for the NATA data rollout tomorrow – Wednesday, August 22

- Desk Statement (note: similar content as the Ethylene Oxide Fact Sheet)
- NATA Overview Fact Sheet (for public dissemination) in English and in Spanish
- Ethylene Oxide Fact Sheet (for public dissemination) in English and in Spanish

The NATA website will go live tomorrow at 2 p.m. est.

We are not doing proactive press. Regions can respond to regional inquiries using the attached desk statement (please keep the regional press box informed of the inquires). HQ OPA will respond to national inquiries.

Please continue to work with your state and local partners.

Also, FYI, the desk statement that Region 5 will use for their Willowbook, Illinois Sterigenics facility issue is also attached.

We will have OAR/OAQPS comms staff on our 12:30 pm est PADs call today for any questions/concerns.

Please do not hesitate to call if we can be of assistance.

Thanks ng

Nancy Grantham
Office of Public Affairs
US Environmental Protection Agency
202-564-6879 (desk)
Personal Privacy / Ex. 6 **(mobile)**

La EPA toma medidas para abordar las emisiones de óxido de etileno
La Evaluación Nacional de Contaminantes Tóxicos del Aire más reciente muestra un factor potencial preocupante para la salud a largo plazo en algunas áreas

DESCRIPCIÓN GENERAL

- **22 DE AGOSTO DE 2018 --** La Agencia de Protección Ambiental (EPA, por sus siglas en inglés) de EE. UU. está tomando medidas para abordar las emisiones de la sustancia química llamada *óxido de etileno* de algunos tipos de instalaciones industriales en todo el país.
- La EPA está abordando el óxido de etileno basándose en los resultados más recientes de la Evaluación Nacional de Contaminantes Tóxicos del Aire (NATA, por sus siglas en inglés), la cual identificó esta sustancia química como factor potencial preocupante en varias áreas de todo el país. La NATA es la herramienta de la Agencia para examinar contaminantes tóxicos del aire en todo el país, diseñada para ayudar a la EPA y a las agencias estatales, locales y tribales encargadas del aire a identificar áreas, contaminantes o tipos de fuentes para examinarlos más a fondo.
- La NATA de 2014 utiliza datos de emisiones provenientes del Inventario Nacional de Emisiones más reciente (los datos más recientes disponibles son de 2014), junto con la información científica más reciente sobre contaminantes tóxicos del aire y sobre la salud, a fin de estimar las exposiciones a contaminantes tóxicos del aire a largo plazo y el factor potencial de riesgo para la salud pública en tramos censados en todo Estados Unidos.
- La NATA estima los riesgos a largo plazo – aquellos que pueden ocurrir por respirar aire que contenga niveles elevados de contaminantes tóxicos continuamente durante muchas décadas. No estima los riesgos a corto plazo (agudos) o intermedios. Sin embargo, basándose en un análisis de los datos disponibles, la EPA no prevé que los niveles de óxido de etileno en el aire en estas áreas sea suficientemente alto como para causar daño inmediato a la salud.
- En todo el país, están disminuyendo las emisiones totales de contaminantes tóxicos del aire, y los datos de monitoreo de la calidad del aire demuestran que las concentraciones de muchos contaminantes tóxicos en el aire, como el benceno, también tienen tendencia a bajar.
- A pesar de estas tendencias, algunas áreas locales todavía enfrentan dificultades. La NATA de 2014 estima que el óxido de etileno contribuye considerablemente a riesgos potencialmente elevados de cáncer en algunos tramos censados en los EE. UU. (menos del 1% del número total de tramos). Estos riesgos elevados se ven impulsados en gran medida por un valor de riesgo de la EPA que fue actualizado a fines de 2016.
- El óxido de etileno es un gas inflamable, incoloro que se usa para fabricar otras sustancias químicas que se utilizan en la elaboración de una gama de productos como anticongelantes, textiles, plásticos, detergentes y adhesivos. También se usa el óxido de etileno para esterilizar equipo y dispositivos plásticos que no pueden esterilizarse con vapor, como el equipo médico.
- La EPA trabajará con la industria y las agencias estatales, locales y tribales encargadas del aire a medida que emprende una estrategia desde dos ángulos a fin de abordar las emisiones de óxido de etileno:

ED_002192_00010439-00001

- *Revisar las reglamentaciones de la Ley de Aire Limpio para las instalaciones que emiten óxido de etileno:*
    - La EPA ha comenzado a revisar sus normas de emisiones de contaminantes tóxicos del aire para diversas plantas manufactureras de sustancias químicas orgánicas, algunas de ellas emisoras de óxido de etileno.
    - La Agencia también planea dar un vistazo más de cerca a sus reglas para otros tipos de instalaciones, comenzando por sus normas de emisiones para esterilizadores comerciales.

Obtener información adicional sobre emisiones de óxido de etileno

- La EPA también está reuniendo información adicional sobre emisiones industriales de óxido de etileno, la cual puede incluir datos de pruebas en algunos tipos de instalaciones.
- Esta información ayudará a la EPA al evaluar oportunidades de reducir las emisiones de óxido de etileno como parte de su revisión de las reglamentaciones.
- También ayudará a la Agencia a determinar si es necesario tomar medidas más inmediatas de reducción de emisiones en algunas sedes en particular.

- La EPA publicará las novedades sobre su labor para abordar el óxido de etileno en su sitio web en inglés: https://www.epa.gov/ethylene-oxide

El óxido de etileno y el riesgo que presenta

- El óxido de etileno en el aire puede provenir de distintos tipos de fuentes, incluidas industrias como fabricantes de sustancias químicas y esterilizadores.

- La exposición a largo plazo al óxido de etileno puede irritar los ojos, la piel, la nariz, la garganta y los pulmones, y dañar el cerebro y el sistema nervioso (causando efectos como dolor de cabeza, pérdida de la memoria, entumecimiento). Los estudios demuestran que respirar aire que contiene niveles elevados de óxido de etileno a lo largo de muchos años aumenta el riesgo de algunos tipos de cáncer, como el cáncer de los glóbulos blancos (linfoma no Hodgkin, mieloma y leucemia linfocítica); y cáncer de mama en las mujeres.

La estrategia de la EPA para abordar las emisiones de óxido de etileno

Revisar las reglamentaciones

- La EPA revisará las reglamentaciones de la Ley de Aire Limpio para las instalaciones que emiten óxido de etileno a fin de asegurarse de que protejan al público contra riesgos significativos. La Agencia ha comenzado la revisión de sus normas de emisiones de contaminantes tóxicos del aire para la industria de manufactura química orgánica miscelánea (llamada "MON" por sus siglas en inglés). La EPA actualizó esta regla la última vez en 2006 y se encuentra bajo una orden judicial para llevar a cabo la revisión de la regla dentro de un plazo hasta marzo de 2020. Como parte de esta revisión, la Agencia considerará riesgos a la salud y al ambiente, junto con avances en prácticas laborales, procesos o controles de emisiones que pueden reducir más las emisiones de contaminantes tóxicos al aire.

ED_002192_00010439-00002

- La Agencia también planea dar un vistazo más de cerca a las normas de emisiones de contaminantes tóxicos del aire para otras industrias que emiten óxido de etileno para determinar si se necesita una revisión de dichas reglas. La EPA comenzará a efectuar esto con sus normas de emisiones de contaminantes tóxicos del aire para esterilizadores comerciales (en inglés).

Reunir información adicional

- Como parte de esta revisión de las reglas, la EPA reunirá información adicional sobre emisiones industriales de óxido de etileno, tales como dónde ocurren las emisiones, la manera en que pueden controlarse estas emisiones y cómo pueden mejorarse los controles actuales de emisiones. La Agencia también puede procurar obtener información de pruebas de emisiones en las instalaciones que emiten óxido de etileno, enfocándose primero en áreas donde la NATA estima que hay un riesgo elevado de cáncer.

- Para el óxido de etileno, las pruebas de *emisiones* de instalaciones, combinadas con modelaciones de la calidad del aire, pueden aportar un panorama más completo del óxido de etileno en el aire en un área mejor que lo que puede lograr el monitoreo de la calidad del aire actualmente. Los métodos existentes de monitoreo no son suficientemente sensibles para detectar el óxido de etileno en todos los niveles en el aire exterior. La EPA está trabajando activamente para desarrollar nuevas técnicas para medir el óxido de etileno en el aire exterior.

- Además, pueden utilizarse los datos de pruebas de emisiones para revisar y desarrollar nuevas reglamentaciones de contaminantes tóxicos del aire; algo que no es posible con los datos del monitoreo de calidad del aire. Conforme a la Ley de Aire Limpio, las reglamentaciones de contaminantes tóxicos del aire se enfocan en establecer límites a la calidad de un contaminante que puede emitir una planta industrial al aire.

- La información que obtenga la EPA ayudará a la Agencia al evaluar oportunidades de reducir las emisiones de óxido de etileno como parte de su revisión de las reglamentaciones. También ayudará a la EPA a determinar si es necesario tomar medidas más inmediatas de reducción de emisiones en algunas plantas en particular.

Cómo obtener más información

- Para ver más información sobre el óxido de etileno, y para conocer novedades sobre la labor de la EPA para abordar el riesgo de esta sustancia química en el aire exterior, visite https://www.epa.gov/ethylene-oxide (en inglés).

- Para saber más detalles sobre la NATA, y ver los resultados de la NATA de 2014, visite https://www.epa.gov/national-air-toxics-assessment (en inglés).

ED_002192_00010439-00003

Message

From: Rimer, Kelly [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=123A21A46D0E4E53A590798CDCC3FB47-KRIMER]
Sent: 10/5/2018 6:42:59 PM
To: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: Re: RE: RE:

Ed is going to call me in a bit

On Oct 5, 2018, at 2:42 PM, Davis, Alison <Davis.Alison@epa.gov> wrote:

> Excellent. Standing by
>
> **From:** Rimer, Kelly
> **Sent:** Friday, October 05, 2018 2:42 PM
> **To:** Davis, Alison <Davis.Alison@epa.gov>
> **Subject:** Re: RE:
>
> Ed and I have connected
>
> On Oct 5, 2018, at 2:24 PM, Davis, Alison <Davis.Alison@epa.gov> wrote:
>
> > Thanks. We'll talk on Tuesday
> >
> > **From:** Rimer, Kelly
> > **Sent:** Friday, October 05, 2018 2:23 PM
> > **To:** Davis, Alison <Davis.Alison@epa.gov>
> > **Subject:** Re:
> >
> > Thanks
> > Still nothing from R5 about the ATSDR piece.
> > I called Ed. I'll follow up with an email.
> >
> > On Oct 5, 2018, at 2:11 PM, Davis, Alison <Davis.Alison@epa.gov> wrote:
> >
> > > Mayor Trilla,
> > >
> > > Attached is some information for you about the differences between the ATSDR letter and our National Air Toxics Assessment, along with a status and next steps update. I welcome your feedback; please let me know if you want more detail. We plan to post the status document on our website early next week.
> > >
> > > Please don't hesitate to call if you have any questions.
> > >
> > > Sincerely,
> > > Kelly Rimer
> > > U.S. EPA Office of Air Quality Planning & Standards
> > > 919-541-5368

<Ethylene oxide in Willowbrook.Status and Next Steps.10.4.18.docx>

Message

From: Rimer, Kelly [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=123A21A46D0E4E53A590798CDCC3FB47-KRIMER]
Sent: 10/13/2018 2:32:03 PM
To: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]; Koerber, Mike [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9c513901d4fd49f9ab101a6f7a7a863e-Koerber, Mike]
Subject: FW: Activities Related to Ethylene Oxide

FYI.

I'm working on clarifications

Kelly

From: Mayor Mickey [mailto:Mickey@mayormickey.com]
Sent: Friday, October 12, 2018 7:46 PM
To: Rimer, Kelly <Rimer.Kelly@epa.gov>
Cc: Douglas Pollock <DPOLLOCK@BURR-RIDGE.GOV>; Evan Walter <EWalter@burr-ridge.gov>
Subject: Activities Related to Ethylene Oxide

Dear Kelly,

Thank you for your efforts on this issue and for coordinating that conference call. I was wondering if you can provide more detail on the "Health Information" page on the EPA link that you provided (https://www.epa.gov/il/sterigenics-willowbrook-facility) to clarify these two paragraphs:

> Long-term exposure to ethylene oxide can irritate the eyes, skin, nose, throat, and lungs, and harm the brain and nervous system (causing effects such as headaches, memory loss, numbness). Studies show that breathing air containing elevated ethylene oxide levels over many years increases the risk of some types of cancers, including cancers of the white blood cells (such as non-Hodgkin's lymphoma, myeloma and lymphocytic leukemia); and breast cancer in females.
>
> U.S. EPA asked the Agency for Toxic Substances and Disease Registry (ATSDR) to evaluate whether ethylene oxide air concentrations near Sterigenics pose a public health problem for people living and working in Willowbrook. ATDSR provided a response in a letter dated July 26, 2018; this evaluation was based not on current conditions, but rather on modeled and monitored ethylene oxide levels prior to the installation of additional controls. ATSDR concluded: "if measured and modeled data represent typical ethylene oxide ambient concentrations in ambient air, an elevated cancer risk exists for residents and offsite workers in the Willowbrook community surrounding the Sterigenics facility. These elevated risks present a public health hazard to these populations."

I'm sure scientists could ask better questions, but would it be possible or practical for the U.S. EPA to define "Long-term Exposure"? How much air would be required to pose a health risk? How do you define "elevated"? How many years would it require? Does exposure mean 24 hours/day? More? Less? How are you defining "elevated cancer risk"?

As it is written and posted, it's no wonder why fear and hysteria is gripping our community and law firms are heavily recruiting people to join in on a class action lawsuit against Sterigenics! And I suppose that "Long-term

exposure" to any number of chemicals would be hazardous to one's health, correct? What is additionally confusing is that I have read ATSDR reports (and spoken with the author) that "there is no immediate health concerns". It's all so vague, ambiguous, sometimes contradictory and scary to read that I think it needs more clarity?

Two weeks have already passed since the high-level meeting occurred at Region 5 and nothing has been said by the U.S. EPA to even remotely calm concerns, *so I'm not surprised that it continues to escalate.* **Is there a current health concern or not?** Frankly, I was given the impression at that meeting that the U.S. EPA was going to do more and disappointed that they have not done so yet…and that they didn't add a section for "Next Steps"?

Will these be some of the questions and topics that will be answered on the scheduled call? There isn't a more important topic or concern that affects our village.

Concerned, Mickey Straub

Mickey Straub
Mayor | Village of Burr Ridge
7660 S. County Line Road, Burr Ridge, IL 60527
MStraub@Burr-Ridge.gov
Mickey@MayorMickey.com
Village: 630-654-8181

From: Rimer, Kelly <Rimer.Kelly@epa.gov>
Sent: Friday, October 12, 2018 9:49 AM
To: Mayor Mickey <Mickey@mayormickey.com>; kweaver@darienil.gov; bvana@darien.il; Ewalter@burr-ridge.gov; Douglas Pollock <DPOLLOCK@BURR-RIDGE.GOV>
Cc: Mckelvey, Laura <Mckelvey.Laura@epa.gov>
Subject: Activities Related to Ethylene Oxide

Dear Mayors and Administrators,

My name is Kelly Rimer and I work in EPA's Office of Air and Radiation (OAR). My office is coordinating the activities related to ethylene oxide emissions from the Sterigenics facility.

We have been in touch with Tim Halik of Willowbrook to begin planning for the public meeting, as Willowbrook was identified as the point of contact. We would like you to be involved in the meeting planning as well. My colleague Laura McKelvey will be in contact with you today to see about setting up a planning meeting for next week.

Also, we are continuing to respond to questions from your communities. We are posting answers on the following website: https://www.epa.gov/il/sterigenics-willowbrook-facility, in the "What's New" section.

Thank you and I look forward to working with you,

Kelly Rimer

US EPA/OAR/OAQPS
rimer.kelly@epa.gov
919-541-5368

Message

From: Ashley, Jackie [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=01A9A3CADFA14C509D09CDAE3498DD43-JASHLEY]
Sent: 10/5/2018 2:46:58 PM
To: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: latest draft.
Attachments: OAR-IL-ETO-STERIGENICS.docx

Here's what I cobbled together.

Message

From: Kelley, Jeff [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E154FA5A5F744C70AA3DA58E3F87AABE-JKELLEY]
Sent: 8/3/2018 12:45:29 PM
To: Grantham, Nancy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=12a3c2ed7158417fb0bb1b1b72a8cfb0-Grantham, Nancy]; Rowan, Anne [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=02cbcc49ddb94091b9f4e358eb001352-ARowan]; Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: RE: any update from ETO meeting with region 5 RA and Bill Wehrum yesterday? thanks ng

I haven't heard anything … if I see Kurt I'll ask him

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

From: Grantham, Nancy
Sent: Friday, August 03, 2018 6:19 AM
To: Kelley, Jeff <kelley.jeff@epa.gov>; Rowan, Anne <rowan.anne@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>
Subject: RE: any update from ETO meeting with region 5 RA and Bill Wehrum yesterday? thanks ng

Specifically related to the ATSDR letter and sterigenics? Thanks ng

Nancy Grantham
Office of Public Affairs
US Environmental Protection Agency
202-564-6879 (desk)
Personal Phone / Ex. 6 **(mobile)**

From: Grantham, Nancy
Sent: Friday, August 03, 2018 7:18 AM
To: Kelley, Jeff <kelley.jeff@epa.gov>; Rowan, Anne <rowan.anne@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>
Subject: any update from ETO meeting with region 5 RA and Bill Wehrum yesterday? thanks ng

Nancy Grantham
Office of Public Affairs
US Environmental Protection Agency
202-564-6879 (desk)
Personal Phone / Ex. 6 **(mobile)**

Message

From: Grantham, Nancy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=12A3C2ED7158417FB0BB1B1B72A8CFB0-GRANTHAM, NANCY]
Sent: 9/10/2018 1:33:40 PM
To: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: Re: IEPA approves stack testing at Sterigenics

Thx

Sent from my iPhone

On Sep 10, 2018, at 9:24 AM, Davis, Alison <Davis.Alison@epa.gov> wrote:

Thanks. Am back and going through emails. Let's catch up soon.

From: Grantham, Nancy
Sent: Saturday, September 8, 2018 3:47 PM
To: Davis, Alison; Cortelyou-Lee, Jan; Rimer, Kelly; Millett, John; DeLuca, Isabel
Subject: Fwd: IEPA approves stack testing at Sterigenics

Sent from my iPhone

Begin forwarded message:

From: "Davis, Matthew" <Davis.Matthew@epa.gov>
Date: September 8, 2018 at 3:30:44 PM EDT
To: "Ringel, Aaron" <ringel.aaron@epa.gov>, "Rodrick, Christian" <rodrick.christian@epa.gov>, "Palich, Christian" <palich.christian@epa.gov>, "Frye, Tony (Robert)" <frye.robert@epa.gov>, "Lyons, Troy" <lyons.troy@epa.gov>
Cc: "Haman, Patricia" <Haman.Patricia@epa.gov>, "Grantham, Nancy" <Grantham.Nancy@epa.gov>, "Richardson, RobinH" <Richardson.RobinH@epa.gov>, "Bowles, Jack" <Bowles.Jack@epa.gov>
Subject: Fwd: IEPA approves stack testing at Sterigenics

FYI - Update on Willowbrook, IL issue for situational awareness. R5 staff have alerted locals and congressionals Friday evening. I believe stack testing may not start until next week (9/17 or so).
-Matthew

Sent from my EPA mobile device

Begin forwarded message:

Subject: IEPA approves stack testing at Sterigenics

Good evening -

US EPA just received notice from Illinois EPA that they have approved Sterigenics' protocol for stack testing of the facility tomorrow. There will be an IEPA employee at the facility to observe the testing. We wanted to make sure you had this information. The city has been informed by IEPA.

Thank you,

Eileen Deamer
EPA Region 5
Congressional and Intergovernmental
(312) 886-1728

Message

From: Ashley, Jackie [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=01A9A3CADFA14C509D09CDAE3498DD43-JASHLEY]
Sent: 10/4/2018 7:32:34 PM
To: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: themes
Attachments: themes-Oct4.docx; Say_No_To_Cancer.pdf

More detail in the attached. Main themes seem to be:

1. Cancer
2. Anger/Fear
3. Secrecy
4. Facility should shut down
5. Do more testing
6. Lawsuits
7. Other facilities in other communities are a danger

PDF was from Sept. 15 protest. Seems to touch on most of these.

Jackie Ashley - US EPA - Office of Air Quality Planning and Standards - 919-541-7664 – ashley.jackie@epa.gov

This is NOT a Cass School District 63 Sponsored Event/Organization

SAY NO TO CANCER IN OUR COMMUNITY

Sterigenics Corporate Headquarters Protest

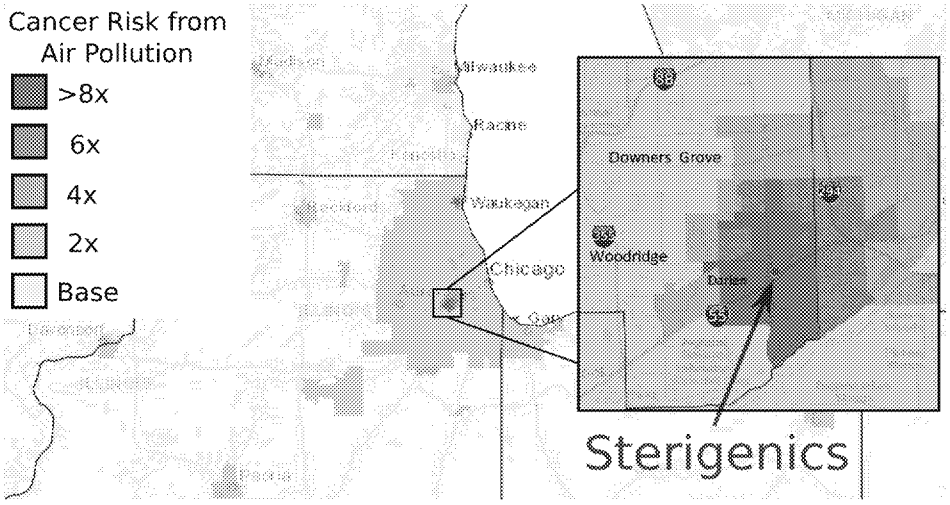
Friday, September 14th 5:30pm
2015 Spring Road, Oak Brook, IL

https://www.facebook.com/StopSterigenics/
Contact: Urszula Tanouye at stopsterigenics@gmail.com

Cancer Causing Gas in Our Community

How did a cancer-causing gas get into our air?
A nearby Sterigenics facility in Willowbrook uses ethylene oxide (EtO) and emits it into the air. EtO is an odorless colorless volatile gas known to cause cancer. At Sterigenics, EtO is used to sterilize and fumigate products on a commercial scale (alternative commercial sterilization methods exist). EtO is heavier than air[1] and sinks down to ground where we walk, drive, and play.

Am I or is my family in Danger?
Anyone who lives, works, or regularly travels near the facilities on this map has been exposed. EtO is carcinogenic by inhalation. Sterigenics has been operating at least one facility here since 1984. It's a 24/7 facility and uses EtO for 100% of its operations.



Modified from 2014 NATA (Reference 5)

What are some published symptoms and effects of EtO exposure?

Chronic low level (long term)[1-4]		Acute high level (short term)[1-4]	
Breast cancer	Headache	Headache	Respiratory irritation
Leukemia	Nausea	Dizziness	Eye irritation
Lymphoma	Memory loss	Memory loss	Excessive thirst
Stomach cancer	Anemia	Nausea	Pulmonary edema
Reproductive difficulty	Skin sensitization & irritation	Vomiting	Emphysema
Miscarriage	Respiratory irritation & infection	Weakness	Wheezing
Eye irritation	Decreased sense of smell	Numbness	Drowsiness

Can I get tested?
Not easily. It takes months to break down in the air[2,3] but EtO is presumed to break down in the body within 48 hours. Only highly specialized labs can perform these tests.

Why didn't we know the risks before?
EtO has long been known to cause cancer (since at least the 1980s[1]), but with new information, risk was reevaluated in 2016. On August 22, 2018, the EPA released its revised report on air pollution (2014 NATA[5]), which flagged a large area around the Willowbrook Sterigenics facility for greatly elevated cancer risk.

What can I do to help stop Ethylene Oxide from polluting our air?
Our air should never have been polluted with toxic EtO. We need your help to #SayNoToEtO by demanding the closure of Willowbrook Sterigenics now and demanding stronger laws to prevent EtO from polluting our air.

- ➔ Tell your elected officials to "Stop the use of Ethylene Oxide in our community immediately" Contact your Mayor, Alderman, IL Representative, IL Senator, US Congressman
- ➔ Spread the word. Anyone who has lived or worked in the Southwest Chicago Suburbs near Willowbrook is affected.
- ➔ Tweet with #StopSterigenics
- ➔ Join our Facebook group "Stop Sterigenics" where you can find more resources and events.

(1) OSHA Guideline for EtO (https://www.cdc.gov/niosh/docs/81-123/pdfs/0275.pdf)
(2) International Agency for Research on Cancer. Ethylene Oxide, IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 100F. Lyon, France: World Health Organization, 2012, https://monographs.iarc.fr/wp-content/uploads/2018/06/mono100F-28.pdf
(3) https://www.epa.gov/sites/production/files/2016-09/documents/ethylene-oxide.pdf
(4) https://www.atsdr.cdc.gov/HAC/pha/sterigenic/Sterigenics_International_Inc-508.pdf
(5) https://www.epa.gov/national-air-toxics-assessment

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 9/21/2018 7:26:24 PM
To: Shappley, Ned [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5fc7fde372054ab5ac38f24b9072b73d-Shappley, N]
Subject: RE: News stories today - Willowbrook

Haha. Thanks!

From: Shappley, Ned
Sent: Friday, September 21, 2018 3:26 PM
To: Davis, Alison <Davis.Alison@epa.gov>
Subject: RE: News stories today - Willowbrook

It looks like Jan does.

From: Davis, Alison
Sent: Friday, 21 September, 2018 15:24
To: Shappley, Ned <Shappley.Ned@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>; Rimer, Kelly <Rimer.Kelly@epa.gov>
Subject: RE: News stories today - Willowbrook

Thanks Ned.
Who owns the Tuesday/Thursday meeting invitation now? It is no longer on my calendar ☺

From: Shappley, Ned
Sent: Friday, September 21, 2018 3:02 PM
To: Davis, Alison <Davis.Alison@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>; Rimer, Kelly <Rimer.Kelly@epa.gov>
Subject: RE: News stories today - Willowbrook

Didn't want to spam everyone's mailbox (but y'alls) with additional articles but here are two others from past day. Also, if you would like me to de-brief my trip at Tuesday's meeting I would be happy to. If so, you may consider extending the meeting 15 minutes or so.

Thanks,
Ned

http://www.chicagotribune.com/news/local/breaking/ct-met-sterigenics-cancer-risks-politics-20180919-story.html

https://wgntv.com/2018/09/20/lawsuits-filed-claiming-suburban-companys-emissions-are-making-people-sick/

From: Davis, Alison
Sent: Friday, 21 September, 2018 14:14
To: Koerber, Mike <Koerber.Mike@epa.gov>; Sasser, Erika <Sasser.Erika@epa.gov>; Rimer, Kelly <Rimer.Kelly@epa.gov>; Lassiter, Penny <Lassiter.Penny@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; Weinstock, Lewis <Weinstock.Lewis@epa.gov>; Shappley, Ned <Shappley.Ned@epa.gov>; Caparoso, Jennifer <Caparoso.Jennifer@epa.gov>; Jones, Rhea <Jones.Rhea@epa.gov>; Riha, Kristin <Riha.Kristin@epa.gov>; Truesdell, Raymond <truesdell.raymond@epa.gov>; Strum, Madeleine <Strum.Madeleine@epa.gov>; Mckelvey, Laura <Mckelvey.Laura@epa.gov>; Mills, Kathy <Mills.Kathy@epa.gov>

Cc: Cortelyou-Lee, Jan <Cortelyou-Lee.Jan@epa.gov>; Ashley, Jackie <Ashley.Jackie@epa.gov>; Terry, Sara <Terry.Sara@epa.gov>
Subject: News stories today - Willowbrook

https://patch.com/illinois/burrridge/chicago-firm-files-law-suit-against-sterigenics

Cancer Patient Sues Sterigenics Amid Nearly Decade-Long Battle

A law firm is representing plaintiff Ryan Feeney, a 26-year-old who was diagnosed with Non-Hodgkin's lymphoma.

By Andrea Earnest, Patch Staff | Sep 20, 2018 2:44 pm ET | Updated Sep 20, 2018 4:59 pm ET

WILLOWBROOK, IL — A Chicago law firm announced Thursday it has filed a lawsuit against Sterigenics International Inc., for civil battery, negligence and public nuisance for knowingly emitting ethylene oxide.

Sterigenics uses ethylene oxide to sterilize medical equipment and other products. The sterilization process emits ethylene oxide, and a report from the U.S. National Cancer Institute notes, "Exposure to (ethylene oxide) is highly irritating to the eyes, skin and respiratory tract, induces nausea and vomiting and causes central

nervous system depression. Ethylene oxide is mutagenic in humans and chronic exposure is associated with an increased risk of leukemia, stomach cancer, pancreatic cancer and non-Hodgkin lymphoma."

The Chicago based firm, Romanucci & Blandin, LLC and Hart McLaughlin & Eldridge are representing plaintiff Ryan Feeney, a 26-year-old who was diagnosed with Non-Hodgkin's lymphoma.

Willowbrook families retained the law firm after a report came out last month, detailing the risks of the ethylene oxide emissions to the community. A report from the Agency for Toxic Substances and Disease Registry, which is a division of the CDC, stated, "If measured and modeled data represent typical EtO ambient concentrations in ambient air, an elevated cancer risk exists for residents and off-site workers in the Willowbrook community surrounding the Sterigenics facility. These evaluated risks present a public health hazard to these populations."

"Neither the extent of Sterigenics' ethylene oxide emissions nor the impact of those emissions on the health of those who live and work in the Willowbrook community was known by the general public until the ATSDR released their report on Aug. 21, and the Aug. 22, 2018 release of the EPA's 2014 National Air Toxics Assessment," Antonio Romanucci, principal and partner at Romanucci & Blandin, LLC, said in a release.

The law firm said that according to data from air samples taken by the EPA in 2018, the Willowbrook census tract posts a cancer risk that is 64 times higher than the EPA's acceptable limits and is in the 99.9th percentile in terms of cancer risk in the country.

The complaint, which has been filed in the Circuit Court of DuPage County, states that Feeney has lived in close proximity of Sterigenics for 22 years and also attended Hinsdale South High School, which is within a one-mile radius of the facility, according to a release from the law firm. Feeney was diagnosed with Non-Hodgkin's Lymphoma in 2010.

The law firm said in a release Feeney was not aware he was at risk of cancer or that his cancer diagnosis was a result of Sterigenics' emissions of ethylene oxide until after a confirming report was released from the U.S. Department of Health and Human Services Agency for Toxic Substances and Disease Registry.

"The potential ramifications of this revelation are catastrophic – the EPA has reported that human exposure to ethylene oxide causes cancer, and numerous other serious health risks, such as DNA mutations and birth defects," Romanucci said in a release. "Ryan Feeney and others who live, work, or have children attending school in and around Willowbrook, including several with cancer or with relatives who have died of cancer, have retained our law firms to investigate the harmful effects of this toxic exposure. Our goal in filing this lawsuit is to hold Sterigenics accountable for their reckless negligence that resulted in the needless and continuous poisoning of men, women and children."

Image via Google Streetview.

Press release on lawsuit

https://www.biospace.com/article/releases/willowbrook-families-file-lawsuit-against-sterigenics-for-their-ethylene-oxide-emissions/

Willowbrook Families File Lawsuit Against Sterigenics for Their Ethylene Oxide Emissions

Published: Sep 21, 2018

Power Rogers & Smith attorneys Todd A. Smith and Brian LaCien are representing Willowbrook families who filed a class action lawsuit against Sterigenics International LLC and GTCR LLC

CHICAGO, Sept. 20, 2018 /PRNewswire/ -- Willowbrook families filed a class action lawsuit against **Sterigenics International LLC** and **GTCR LLC** on September 20 for their decades-old emissions of a highly carcinogenic chemical compound called ethylene oxide.

Sterigenics has been operating a facility in Willowbrook, Illinois since 1984 and uses ethylene oxide to sterilize food/spice products, pharmaceuticals, and medical equipment. The United States Department of Health and Human Services released an August 2018 consultation letter regarding the health impacts from ethylene oxide emissions and concluded that Willowbrook residents and workers alike are at an increased risk of cancer and other health problems, such as neurological effects, respiratory and gastrointestinal effects.

Todd A. Smith and Brian LaCien, attorneys from the law firm of Power Rogers & Smith of Chicago, and Stephen Tillery and John Libra, attorneys from the law firm of Korein Tillery, made the filing today at the Cook County Courthouse in Chicago, Illinois.

"These families and many others in the area now have to go about their daily lives knowing they're living and breathing a harmful, carcinogenic chemical that shouldn't have been used in the first place," Smith said, referencing Sterigenics' ethylene oxide emissions.

The lawsuit filed contains 5 counts, including claims for negligence and strict liability from the severe injuries suffered as a result of ethylene oxide inhalation, claims for nuisance and trespass for the contamination on property, and near their property, and a claim for fraudulent concealment for Sterigenics' decades-long cover up of ethylene oxide's highly carcinogenic nature. The suit contends that for 34 years, Sterigenics has knowingly emitted ethylene oxide into the air, allowing Willowbrook and the surrounding area to be contaminated by a highly carcinogenic chemical.

"This chemical, ethylene oxide, has been a known human carcinogen in the United States and international world since the mid-20th century," said LaCien. "Sterigenics needs to be held responsible for the injuries they've caused and the damage they've done to families and their homes."

View original content:http://www.prnewswire.com/news-releases/willowbrook-families-file-lawsuit-against-sterigenics-for-their-ethylene-oxide-emissions-300716588.html

SOURCE Power Rogers & Smith

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 8/17/2018 8:03:38 PM
To: DeLuca, Isabel [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0b021c30cbee4637a7c7ca683e5e044a-IDELUCA]
Subject: try this
Attachments: 20180809-sterigenic_news_release-v2.3.OAQPS.docx

Will this work?

Alison Davis
Acting Director
Policy Analysis & Communications Staff
US EPA, Office of Air Quality Planning & Standards
Research Triangle Park, NC 27711
Desk: 919-541-7587
Mobile: 919-624-0872

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 9/26/2018 8:44:35 PM
To: Millett, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c067caa6c93544f78c26ab08cc567d27-Millett, John]
CC: DeLuca, Isabel [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0b021c30cbee4637a7c7ca683e5e044a-IDELUCA]
Subject: RE: Starting Draft

Importance: High

What document is this? We just finished reworking and are about to send back

---

From: Millett, John
Sent: Wednesday, September 26, 2018 4:14 PM
To: Davis, Alison <Davis.Alison@epa.gov>
Cc: DeLuca, Isabel <DeLuca.Isabel@epa.gov>
Subject: Fwd: Starting Draft

FYI

Sent from my iPhone

Begin forwarded message:

> **From:** "Wehrum, Bill" <Wehrum.Bill@epa.gov>
> **Date:** September 26, 2018 at 4:06:22 PM EDT
> **To:** "Millett, John" <Millett.John@epa.gov>
> **Subject: Fwd: Starting Draft**
>
> _____
> Bill Wehrum
> Assistant Administrator
> Office of Air and Radiation
> U.S. Environmental Protection Agency
> (202) 564-7404
>
> Begin forwarded message:
>
> > **From:** "Woods, Clint" <woods.clint@epa.gov>
> > **Date:** September 26, 2018 at 3:00:12 PM EDT
> > **To:** "Konkus, John" <konkus.john@epa.gov>, "Stepp, Cathy" <stepp.cathy@epa.gov>, "Gunasekara, Mandy" <Gunasekara.Mandy@epa.gov>, "Lyons, Troy" <lyons.troy@epa.gov>, "Grantham, Nancy" <Grantham.Nancy@epa.gov>, "Thiede, Kurt" <thiede.kurt@epa.gov>
> > **Cc:** "Jackson, Ryan" <jackson.ryan@epa.gov>, "Wehrum, Bill" <Wehrum.Bill@epa.gov>
> > **Subject: Re: Starting Draft**

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

On Sep 26, 2018, at 2:58 PM, Woods, Clint <woods.clint@epa.gov> wrote:

+ Bill

On Sep 26, 2018, at 2:56 PM, Woods, Clint <woods.clint@epa.gov> wrote:

Deliberative Process / Ex. 5

Clint Woods
Deputy Assistant Administrator
Office of Air and Radiation, U.S. EPA
202.564.6562

From: Konkus, John
Sent: Wednesday, September 26, 2018 2:25 PM
To: Stepp, Cathy <stepp.cathy@epa.gov>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; Lyons, Troy <lyons.troy@epa.gov>; Grantham, Nancy <Grantham.Nancy@epa.gov>; Thiede, Kurt <thiede.kurt@epa.gov>; Woods, Clint <woods.clint@epa.gov>
Cc: Jackson, Ryan <jackson.ryan@epa.gov>
Subject: Starting Draft

Deliberative Process / Ex. 5

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 8/17/2018 6:30:14 PM
To: Koerber, Mike [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9c513901d4fd49f9ab101a6f7a7a863e-Koerber, Mike]
Subject: Rollout options.8.17.18.docx
Attachments: Rollout options.8.17.18.docx

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 6/22/2018 9:06:33 PM
To: Sasser, Erika [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=477638fe84004800bfdf8e62fe3cafc8-ESASSER]
Subject: RE: Willowbrook Air Monitoring Data

Thanks.

From: Sasser, Erika
Sent: Friday, June 22, 2018 4:51 PM
To: Tsirigotis, Peter <Tsirigotis.Peter@epa.gov>
Cc: Davis, Alison <Davis.Alison@epa.gov>; Rimer, Kelly <Rimer.Kelly@epa.gov>
Subject: Fwd: Willowbrook Air Monitoring Data

Please note his request not to distribute further.

Sent from my iPhone

Begin forwarded message:

> **From:** "Nam, Ed" <nam.ed@epa.gov>
> **Date:** June 22, 2018 at 4:39:31 PM EDT
> **To:** "Sasser, Erika" <Sasser.Erika@epa.gov>
> **Cc:** "Wayland, Richard" <Wayland.Richard@epa.gov>
> **Subject: FW: Willowbrook Air Monitoring Data**
>
> Erika, Chet,
>
> The message to the EPA Willowbrook office just went out. Erika our last minute correction in first paragraph got in!
> Please limit distribution.
>
> Thanks,
> -Ed
>
> ---
>
> **From:** Payne, James
> **Sent:** Friday, June 22, 2018 3:28 PM
> **To:** Mitchell, James <mitchell.james@epa.gov>; Vega, Sonia <vega.sonia@epa.gov>; Hassan, Jacob <hassan.jacob@epa.gov>; Ruesch, Paul <ruesch.paul@epa.gov>; Cooper, Brian <cooper.brian@epa.gov>; Roth, Charles <roth.charles@epa.gov>; Rebot, David <rebot.david@epa.gov>; Canar, John <canar.john@epa.gov>; Ursic, James <ursic.james@epa.gov>; Aparicio, Jesse <Aparicio.Jesse@epa.gov>; Padovani, Steven <padovani.steven@epa.gov>; Short, Thomas <short.thomas@epa.gov>; Borries, Samuel <borries.samuel@epa.gov>; Ballotti, Doug <ballotti.douglas@epa.gov>
> **Cc:** Stepp, Cathy <stepp.cathy@epa.gov>; Thiede, Kurt <thiede.kurt@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Newton, Cheryl <Newton.Cheryl@epa.gov>; Glover, John <Glover.John@epa.gov>
> **Subject:** Willowbrook Air Monitoring Data
>
> Dear Willowbrook Employees,

Our Air program has conducted screening-level air toxics modeling and sampling near the Willowbrook, IL office over the last several months. Just recently it has come to my attention that the results of the screening activities detected low levels of ethylene oxide (EtO) in the air outside the office. As you may know, EtO is a flammable gas used as a sterilizing agent for medical equipment and as a chemical intermediate in the manufacture of other chemicals.

The levels detected were far below the levels that would be expected to result in health effects from acute or intermediate exposure, but EPA plans to conduct additional work to ensure that it understands the source and long term exposure of EtO in the area, including any effects on indoor air quality.

As indicated by the **attached** fact sheet and information from the Agency for Toxic Substances and Disease Registry (ATSDR), the levels detected using a 12-hour grab-sample were several orders of magnitude below important short-term health values. These monitored concentrations were about 20 times below the ATSDR's screening levels for intermediate inhalation as well as more than 1500 times below the concentration identified by the federal Acute Exposure Guideline Level at which the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects.

The Agency continues to work to address EtO and other air toxics at the national level to reduce long-term, life-time exposures for chemicals posing chronic cancer risks.

Our Region has and will continue to be on the frontline in developing appropriate sampling and analysis procedures for EtO. To that end, EPA has a proposal to fund more sensitive sampling and a plan to develop an analytical procedure to evaluate the modeled risk to determine future action by the agency to mitigate emissions of EtO. EPA Region 5 has many EtO facilities and thus some of the greatest immediate need for this more sensitive monitoring technology in the nation. In addition, we are working closely with other parts of EPA to develop a comprehensive monitoring and assessment strategy for the Willowbrook office.

While our agency continues its work on this issue, employees and residents of Region 5 should be confident in our current assessment that the levels of EtO measured at Willowbrook do not pose an immediate health risk.

Thank you all for your continued work for the American people and please enjoy your weekend. If you have additional questions, feel free to contact me and I will make sure that your questions are addressed.

Jim

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 9/26/2018 6:34:51 PM
To: Shappley, Ned [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5fc7fde372054ab5ac38f24b9072b73d-Shappley, N]
Subject: Fwd: Please review this version - EtO Willowbrook response DRAFT2.docx
Attachments: EtO Willowbrook response DRAFT2.docx; ATT00001.htm

Alison Davis
Acting Director
Policy Analysis & Communications Staff
US EPA, Office of Air Quality Planning & Standards
Research Triangle Park, NC 27711
Desk: 919-541-7587
Mobile: Personal Phone / Ex. 6

Sent from my iPhone

Begin forwarded message:

> **From:** "Davis, Alison" <Davis.Alison@epa.gov>
> **Date:** September 26, 2018 at 2:30:02 PM EDT
> **To:** "Koerber, Mike" <Koerber.Mike@epa.gov>, "Rimer, Kelly" <Rimer.Kelly@epa.gov>, "Bremer, Kristen" <Bremer.Kristen@epa.gov>
> **Subject: Please review this version - EtO Willowbrook response DRAFT2.docx**

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 8/10/2018 2:07:04 PM
To: Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]
Subject: RE: Sterigenics next steps

Has this moved? Thanks

-----Original Appointment-----
From: Nam, Ed
Sent: Thursday, August 09, 2018 7:49 PM
To: Nam, Ed; Siegel, Kathryn; Furey, Eileen; Koerber, Mike; Rimer, Kelly; Sasser, Erika; Cain, Alexis
Cc: Davis, Alison; Bremer, Kristen
Subject: Fwd: Sterigenics next steps
When: Friday, August 10, 2018 9:00 AM-10:00 AM (UTC-06:00) Central Time (US & Canada).
Where: conference line: **conference line/code / Ex. 6**

Sent from my iPhone

Begin forwarded message:

> **From:** "Nam, Ed" <nam.ed@epa.gov>
> **To:** "Siegel, Kathryn" <siegel.kathryn@epa.gov>, "Furey, Eileen" <furey.eileen@epa.gov>, "Koerber, Mike" <Koerber.Mike@epa.gov>, "Rimer, Kelly" <Rimer.Kelly@epa.gov>, "Sasser, Erika" <Sasser.Erika@epa.gov>, "Cain, Alexis" <cain.alexis@epa.gov>
> **Subject: Sterigenics next steps**
>
> Delaying meeting a bit.
> Thanks
> -Ed
>
> Can we meet tomorrow to discuss some recent events?
> Thanks,
> -Ed

Appointment

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 8/10/2018 12:39:54 PM
To: Nam, Ed [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A2653F1DDD59470688BA557DD84D9690-NAM, ED]

Subject: Accepted: Sterigenics next steps
Location: conference line: conference line/code / Ex. 6

Start: 8/10/2018 2:00:00 PM
End: 8/10/2018 3:00:00 PM

Recurrence: (none)

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 10/18/2018 11:43:20 AM
To: Long, Pam [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f32548c120b14bd2af1d2c2a12bf641c-PLONG]
Subject: Another for the tracker
Attachments: ATT00001.txt; doc01610820181011144958.pdf

This was a letter to Mike Koerber – please add the attachment – you can summarize the questions from that

---

From: Rimer, Kelly
Sent: Friday, October 12, 2018 8:45 AM
To: Davis, Alison <Davis.Alison@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>
Subject: FW: Willowbrook Sterigenics and News Release from IEPA dated 10/2/18

From: Tim Halik [mailto:thalik@willowbrook.il.us]
Sent: Thursday, October 11, 2018 4:13 PM
To: Koerber, Mike <Koerber.Mike@epa.gov>
Cc: Rimer, Kelly <Rimer.Kelly@epa.gov>; Gayle Neal <gneal@willowbrook.il.us>; Frank Trilla <ftrilla@willowbrook.il.us>
Subject: Willowbrook Sterigenics and News Release from IEPA dated 10/2/18

Dear Mr. Koerber –

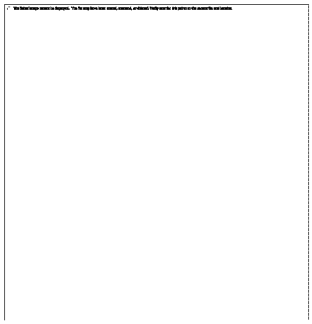
Please see the attached correspondence from Willowbrook Trustee Gayle Neal, who is also serving as the coordinator of our Environmental Task Force formed to study and address the emissions from Sterigenics.

If you have any questions, please don't hesitate to contact us at 630.920.2261.

Thank you.

Tim Halik
Village Administrator
Village of Willowbrook
835 Midway Drive
Willowbrook, IL 60527

Office (direct): 630.920.2261
Fax: 630.323.0787
E-mail: thalik@willowbrook.il.us
Web: www.willowbrookil.org



This Bitmap image contains the Bayesian, "Yes" for using Bayes, Bayes' standard, statistical, and statistical finally used for the purpose of the assessment for each location.

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 8/24/2018 12:14:55 PM
To: Koerber, Mike [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9c513901d4fd49f9ab101a6f7a7a863e-Koerber, Mike]
Subject: link

https://www.epa.gov/il/sterigenics-willowbrook-facility-documents

---

Alison Davis
Acting Director
Policy Analysis & Communications Staff
US EPA, Office of Air Quality Planning & Standards
Research Triangle Park, NC 27711
Desk: 919-541-7587
Mobile: 919-624-0872

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 8/23/2018 6:31:07 PM
To: Grantham, Nancy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=12a3c2ed7158417fb0bb1b1b72a8cfb0-Grantham, Nancy]
Subject: Re: Sterigenics documents

Still in meeting

Sent from my iPhone

On Aug 23, 2018, at 2:28 PM, Grantham, Nancy <Grantham.Nancy@epa.gov> wrote:

Let me know when you want to talk this and the community call thanks ng

Nancy Grantham
Office of Public Affairs
US Environmental Protection Agency
202-564-6879 (desk)
202-253-7056 (mobile)

From: Deamer, Eileen
Sent: Thursday, August 23, 2018 2:24 PM
To: Grantham, Nancy <Grantham.Nancy@epa.gov>; Payne, James <payne.james@epa.gov>
Cc: Bremer, Kristen <Bremer.Kristen@epa.gov>
Subject: FW: Sterigenics documents

So the region 5 "page" is up and sent to Kristen Bremer to link to the national page.

Deliberative Process / Ex. 5

Thanks,

Eileen Deamer
U.S. EPA Region 5
Congressional and Intergovernmental
(312) 886-1728

From: Pina, Yvette
Sent: Thursday, August 23, 2018 1:19 PM
To: Reshkin, Karen <Reshkin.Karen@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>
Cc: Deamer, Eileen <deamer.eileen@epa.gov>
Subject: Sterigenics documents

https://www.epa.gov/il/sterigenics-willowbrook-facility-documents

ATSDR's document and the Air Sampling summary are posted.

If there is language or text you'd like added please let me know.

Yvette
312-353-8439

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 10/1/2018 6:12:07 PM
To: Koerber, Mike [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9c513901d4fd49f9ab101a6f7a7a863e-Koerber, Mike]
Subject: ETO R5 latest draft.docx
Attachments: ETO R5 latest draft.docx

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 10/18/2018 11:38:19 AM
To: Long, Pam [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f32548c120b14bd2af1d2c2a12bf641c-PLONG]
Subject: For the tracker
Attachments: ATT00001.txt; EPA Atmospheric Persistence of Eight Air Toxics see page 44.pdf

---

From: Rimer, Kelly
Sent: Monday, October 15, 2018 9:05 AM
To: Bremer, Kristen <Bremer.Kristen@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>
Cc: Hollingsworth, Terri <Hollingsworth.Terri@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>
Subject: FW: EtO Question - Affects of Rain

Another question from Willowbrook
He would like the answer to be posted on our website

From: Tim Halik [mailto:thalik@willowbrook.il.us]
Sent: Monday, October 15, 2018 8:58 AM
To: Rimer, Kelly <Rimer.Kelly@epa.gov>
Cc: John Wawak <johnwawak@yahoo.com>; Frank Trilla <ftrilla@willowbrook.il.us>
Subject: FW: EtO Question - Affects of Rain

Kelly –

In a previous discussion with Sterigenics personnel, our mayor was advised that EtO is a highly reactive substance and breaks down quickly in sunlight and water. Mayor Trilla subsequently shared this information with an individual from the public, Mr. John Wawak. Based on Mr. Wawak's review of applicable information, he questions whether it is accurate that rain washes EtO from the atmosphere. He forwarded the attached information in support of his position.

Could the USEPA staff please review this information to determine the correct answer to the question? I would anticipate that you could provide the answer on the Q&A format on your Sterigenics website.

Thank you.

Tim Halik
Village Administrator
Village of Willowbrook
835 Midway Drive
Willowbrook, IL 60527

Office (direct): 630.920.2261
Fax: 630.323.0787
E-mail: thalik@willowbrook.il.us
Web: www.willowbrookil.org

From: Citizen Name / Ex. 6 Personal Citizen Email / Ex. 6
Sent: Friday, October 12, 2018 3:28 PM
To: Tim Halik <thalik@willowbrook.il.us>
Subject: EtO - Affects of Rain

Tim,

I was talking with Mayor Trilla and he mentioned someone (I believe from the EPA) told him that rain washes EtO from the atmosphere.

That is contrary to what I understood. I know that everyone is trying to locate the best and right data.

I have attached a 1985 EPA document that states that rain does not have the affect of washing Ethylene Oxide from the air.

See pages 50 & 51 of the file (page 44 & 45 of the report).

aqueous phase. Even without considering revolatilization of the chemical, however, rain out will still not be effective in removing the chemical from the environment: the estimated lifetime due to rain out is hundreds of years. Experimental measurements and theoretical modeling of rain out effects have demonstrated little impact from rain out for gases which are even far more soluble than ethylene oxide.[56]

Perhaps there is updated science on that conclusion?

Regards,

Citizen Name / Ex. 6

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 10/1/2018 6:02:00 PM
To: Kelley, Jeff [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e154fa5a5f744c70aa3da58e3f87aabe-JKelley]
CC: Grantham, Nancy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=12a3c2ed7158417fb0bb1b1b72a8cfb0-Grantham, Nancy]; Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
Subject: RE: Draft Sterigenics web page

Got it. Thanks.

From: Kelley, Jeff
Sent: Monday, October 01, 2018 1:55 PM
To: Davis, Alison <Davis.Alison@epa.gov>
Cc: Grantham, Nancy <Grantham.Nancy@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: Draft Sterigenics web page

Alison, here's the log in information for the revised Sterigenics web page. Thanks for coordinating the OAQPS review.

Log in to Drupal using your LAN ID and password:

https://wcms.epa.gov/user

Then copy paste:
https://wcms.epa.gov/il/sterigenics-willowbrook-facility

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 8/15/2018 12:42:01 PM
To: Kelley, Jeff [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e154fa5a5f744c70aa3da58e3f87aabe-JKelley]
Subject: RE: Draft Sterigenics news release

Personal Matters / Ex. 6 So if we can talk between 9 and 12 your time, that would be great.

From: Davis, Alison
Sent: Tuesday, August 14, 2018 8:15 PM
To: Kelley, Jeff <kelley.jeff@epa.gov>
Subject: Re: Draft Sterigenics news release

OK. I am in meetings from7-9 your time, but can talk after

Sent from my iPhone

On Aug 14, 2018, at 7:10 PM, Kelley, Jeff <kelley.jeff@epa.gov> wrote:

> Sorry, Alison, I lost control of my day and didn't get back to you. Will try to call first thing in the morning.
>
> ------
> ***Jeff Kelley***
> *Director, Office of External Communications*
> *U.S. EPA Region 5*
> *ph: 312-353-1159*
>
> On Aug 14, 2018, at 9:00 AM, Davis, Alison <Davis.Alison@epa.gov> wrote:
>
>> No worries. Listen to vmail and give me a shout when you can
>>
>> ---
>>
>> **From:** Kelley, Jeff
>> **Sent:** Tuesday, August 14, 2018 10:00 AM
>> **To:** Davis, Alison <Davis.Alison@epa.gov>
>> **Subject:** RE: Draft Sterigenics news release
>>
>> I'm in a meeting for about an hour
>>
>> ---
>> ***Jeff Kelley***
>> *Director, Office of External Communications*
>> *U.S. EPA Region 5*
>> *ph: 312-353-1159*
>>
>> ---
>>
>> **From:** Davis, Alison
>> **Sent:** Tuesday, August 14, 2018 8:56 AM

To: Kelley, Jeff <kelley.jeff@epa.gov>; Grantham, Nancy <Grantham.Nancy@epa.gov>
Cc: DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Singer, Joshua <Singer.Joshua@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Subject: RE: Draft Sterigenics news release

Thanks Jeff. We will review. Calling you in a minute

From: Kelley, Jeff
Sent: Tuesday, August 14, 2018 9:46 AM
To: Grantham, Nancy <Grantham.Nancy@epa.gov>
Cc: Davis, Alison <Davis.Alison@epa.gov>; DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Singer, Joshua <Singer.Joshua@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Subject: Draft Sterigenics news release

Nancy, attached is the current draft of the Sterigenics news release. This has been reviewed by the Region and in ATSDR. It's unclear to me who has seen it in OAR, which is why I'm copying Allison, Kristen and Isabel.

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 10/18/2018 9:18:34 PM
To: Koerber, Mike [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9c513901d4fd49f9ab101a6f7a7a863e-Koerber, Mike]; Rimer, Kelly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=123a21a46d0e4e53a590798cdcc3fb47-KRIMER]
Subject: URGENT - Tribune on Deadline

Mike -- please have a look at this. I have one question about it – Could you give me a quick call?

Incoming

Vantage Specialty Chemicals reported emitting 2,607 pounds of ethylene oxide to the Toxics Release Inventory in 2014, but when Illinois EPA gave U.S. EPA data for the 2014 National Emissions Inventory, Illinois EPA listed ZERO pounds of ethylene oxide from Vantage . As a result, the modeled cancer risks in Lake County were significantly lower than what the risk level would be if the Vantage emissions had been included. Why/how did this happen? What does U.S. EPA plan to tell concerned citizens near Vantage in light of the intense public interest and outcry involving Sterigenics in Willowbrook?

Will EPA model dispersion of EtO emissions from Vantage, similar to what it plans to do with Sterigenics? If not, why? This is an important question given the fact that Vantage reported emitting 11,541 lbs of EtO to TRI in 2016, compared to 4,205 pounds of EtO repoted to TRI by Sterigenics. As in Willowbrook, several thousand people live in close proximity to Vantage.

What specifically is U.S. EPA doing to follow up on the elevated cancer risks in Lake County census tracts near Medline Industries in Waukegan? According to data provided by Illinois EPA for the National Emissions Inventory, Medline emitted about 3,000 pounds of ethylene oxide in 2014, second only to Sterigenics in Willowbrook.

Is U.S. EPA planning to request an ATSDR consultation in Lake County, similar to the one conducted in the Willowbrook area? If not, why?

DRAFT ANSWER

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 9/21/2018 7:34:28 PM
To: Smith, Darcie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3ae3c2377efb42879b943db8796ddc05-Smith, Darcie]; Shappley, Ned [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5fc7fde372054ab5ac38f24b9072b73d-Shappley, N]; Rimer, Kelly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=123a21a46d0e4e53a590798cdcc3fb47-KRIMER]
Subject: RE: News stories today - Willowbrook

That was the error I made. I had forgotten! I will fix that! ☺

From: Smith, Darcie
Sent: Friday, September 21, 2018 3:27 PM
To: Davis, Alison <Davis.Alison@epa.gov>; Shappley, Ned <Shappley.Ned@epa.gov>; Rimer, Kelly <Rimer.Kelly@epa.gov>
Subject: RE: News stories today - Willowbrook

Jan has them through October 1, when yours (Alison) are every day from 8-9 am.

Darcie Smith
U.S. EPA/OAQPS/ATAG
919.541.2076
smith.darcie@epa.gov

From: Davis, Alison
Sent: Friday, September 21, 2018 3:24 PM
To: Shappley, Ned <Shappley.Ned@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>; Rimer, Kelly <Rimer.Kelly@epa.gov>
Subject: RE: News stories today - Willowbrook

Thanks Ned.
Who owns the Tuesday/Thursday meeting invitation now? It is no longer on my calendar ☺

From: Shappley, Ned
Sent: Friday, September 21, 2018 3:02 PM
To: Davis, Alison <Davis.Alison@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>; Rimer, Kelly <Rimer.Kelly@epa.gov>
Subject: RE: News stories today - Willowbrook

Didn't want to spam everyone's mailbox (but y'alls) with additional articles but here are two others from past day. Also, if you would like me to de-brief my trip at Tuesday's meeting I would be happy to. If so, you may consider extending the meeting 15 minutes or so.

Thanks,
Ned

http://www.chicagotribune.com/news/local/breaking/ct-met-sterigenics-cancer-risks-politics-20180919-story.html

https://wgntv.com/2018/09/20/lawsuits-filed-claiming-suburban-companys-emissions-are-making-people-sick/

From: Davis, Alison
Sent: Friday, 21 September, 2018 14:14
To: Koerber, Mike <Koerber.Mike@epa.gov>; Sasser, Erika <Sasser.Erika@epa.gov>; Rimer, Kelly <Rimer.Kelly@epa.gov>; Lassiter, Penny <Lassiter.Penny@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; Weinstock, Lewis <Weinstock.Lewis@epa.gov>; Shappley, Ned <Shappley.Ned@epa.gov>; Caparoso, Jennifer <Caparoso.Jennifer@epa.gov>; Jones, Rhea <Jones.Rhea@epa.gov>; Riha, Kristin <Riha.Kristin@epa.gov>; Truesdell, Raymond <truesdell.raymond@epa.gov>; Strum, Madeleine <Strum.Madeleine@epa.gov>; Mckelvey, Laura <Mckelvey.Laura@epa.gov>; Mills, Kathy <Mills.Kathy@epa.gov>
Cc: Cortelyou-Lee, Jan <Cortelyou-Lee.Jan@epa.gov>; Ashley, Jackie <Ashley.Jackie@epa.gov>; Terry, Sara <Terry.Sara@epa.gov>
Subject: News stories today - Willowbrook

https://patch.com/illinois/burrridge/chicago-firm-files-law-suit-against-sterigenics

Cancer Patient Sues Sterigenics Amid Nearly Decade-Long Battle

A law firm is representing plaintiff Ryan Feeney, a 26-year-old who was diagnosed with Non-Hodgkin's lymphoma.

By Andrea Earnest, Patch Staff | Sep 20, 2018 2:44 pm ET | Updated Sep 20, 2018 4:59 pm ET

WILLOWBROOK, IL — A Chicago law firm announced Thursday it has filed a lawsuit against Sterigenics International Inc., for civil battery, negligence and public nuisance for knowingly emitting ethylene oxide.

Sterigenics uses ethylene oxide to sterilize medical equipment and other products. The sterilization process emits ethylene oxide, and a report from the U.S. National Cancer Institute notes, "Exposure to (ethylene oxide) is highly irritating to the eyes, skin and respiratory tract, induces nausea and vomiting and causes central nervous system depression. Ethylene oxide is mutagenic in humans and chronic exposure is associated with an increased risk of leukemia, stomach cancer, pancreatic cancer and non-Hodgkin lymphoma."

The Chicago based firm, Romanucci & Blandin, LLC and Hart McLaughlin & Eldridge are representing plaintiff Ryan Feeney, a 26-year-old who was diagnosed with Non-Hodgkin's lymphoma.

Willowbrook families retained the law firm after a report came out last month, detailing the risks of the ethylene oxide emissions to the community. A report from the Agency for Toxic Substances and Disease Registry, which is a division of the CDC, stated, "If measured and modeled data represent typical EtO ambient concentrations in ambient air, an elevated cancer risk exists for residents and off-site workers in the Willowbrook community surrounding the Sterigenics facility. These evaluated risks present a public health hazard to these populations."

"Neither the extent of Sterigenics' ethylene oxide emissions nor the impact of those emissions on the health of those who live and work in the Willowbrook community was known by the general public until the ATSDR

released their report on Aug. 21, and the Aug. 22, 2018 release of the EPA's 2014 National Air Toxics Assessment," Antonio Romanucci, principal and partner at Romanucci & Blandin, LLC, said in a release.

The law firm said that according to data from air samples taken by the EPA in 2018, the Willowbrook census tract posts a cancer risk that is 64 times higher than the EPA's acceptable limits and is in the 99.9th percentile in terms of cancer risk in the country.

The complaint, which has been filed in the Circuit Court of DuPage County, states that Feeney has lived in close proximity of Sterigenics for 22 years and also attended Hinsdale South High School, which is within a one-mile radius of the facility, according to a release from the law firm. Feeney was diagnosed with Non-Hodgkin's Lymphoma in 2010.

The law firm said in a release Feeney was not aware he was at risk of cancer or that his cancer diagnosis was a result of Sterigenics' emissions of ethylene oxide until after a confirming report was released from the U.S. Department of Health and Human Services Agency for Toxic Substances and Disease Registry.

"The potential ramifications of this revelation are catastrophic – the EPA has reported that human exposure to ethylene oxide causes cancer, and numerous other serious health risks, such as DNA mutations and birth defects," Romanucci said in a release. "Ryan Feeney and others who live, work, or have children attending school in and around Willowbrook, including several with cancer or with relatives who have died of cancer, have retained our law firms to investigate the harmful effects of this toxic exposure. Our goal in filing this lawsuit is to hold Sterigenics accountable for their reckless negligence that resulted in the needless and continuous poisoning of men, women and children."

Image via Google Streetview.

Press release on lawsuit

https://www.biospace.com/article/releases/willowbrook-families-file-lawsuit-against-sterigenics-for-their-ethylene-oxide-emissions/

Willowbrook Families File Lawsuit Against Sterigenics for Their Ethylene Oxide Emissions

Published: Sep 21, 2018

Power Rogers & Smith attorneys Todd A. Smith and Brian LaCien are representing Willowbrook families who filed a class action lawsuit against Sterigenics International LLC and GTCR LLC

CHICAGO, Sept. 20, 2018 /PRNewswire/ -- Willowbrook families filed a class action lawsuit against **Sterigenics International LLC** and **GTCR LLC** on September 20 for their decades-old emissions of a highly carcinogenic chemical compound called ethylene oxide.

Sterigenics has been operating a facility in Willowbrook, Illinois since 1984 and uses ethylene oxide to sterilize food/spice products, pharmaceuticals, and medical equipment. The United States Department of Health and Human Services released an August 2018 consultation letter regarding the health impacts from ethylene oxide emissions and concluded that Willowbrook residents and workers alike are at an increased risk of cancer and other health problems, such as neurological effects, respiratory and gastrointestinal effects.

Todd A. Smith and Brian LaCien, attorneys from the law firm of Power Rogers & Smith of Chicago, and Stephen Tillery and John Libra, attorneys from the law firm of Korein Tillery, made the filing today at the Cook County Courthouse in Chicago, Illinois.

"These families and many others in the area now have to go about their daily lives knowing they're living and breathing a harmful, carcinogenic chemical that shouldn't have been used in the first place," Smith said, referencing Sterigenics' ethylene oxide emissions.

The lawsuit filed contains 5 counts, including claims for negligence and strict liability from the severe injuries suffered as a result of ethylene oxide inhalation, claims for nuisance and trespass for the contamination on property, and near their property, and a claim for fraudulent concealment for Sterigenics' decades-long cover up of ethylene oxide's highly carcinogenic nature. The suit contends that for 34 years, Sterigenics has knowingly emitted ethylene oxide into the air, allowing Willowbrook and the surrounding area to be contaminated by a highly carcinogenic chemical.

"This chemical, ethylene oxide, has been a known human carcinogen in the United States and international world since the mid-20th century," said LaCien. "Sterigenics needs to be held responsible for the injuries they've caused and the damage they've done to families and their homes."

View original content:http://www.prnewswire.com/news-releases/willowbrook-families-file-lawsuit-against-sterigenics-for-their-ethylene-oxide-emissions-300716588.html

SOURCE Power Rogers & Smith

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 8/20/2018 11:11:38 PM
To: Nam, Ed [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a2653f1ddd59470688ba557dd84d9690-Nam, Ed]; Koerber, Mike [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9c513901d4fd49f9ab101a6f7a7a863e-Koerber, Mike]
CC: Kelley, Jeff [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e154fa5a5f744c70aa3da58e3f87aabe-JKelley]; Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
Subject: RE: ATSDR letter Sterigenics

Thanks all.

From: Nam, Ed
Sent: Monday, August 20, 2018 7:10 PM
To: Davis, Alison <Davis.Alison@epa.gov>; Koerber, Mike <Koerber.Mike@epa.gov>
Cc: Kelley, Jeff <kelley.jeff@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: ATSDR letter Sterigenics

Alison, Mike,

I am informed that ATSDR will post their letter to their website at 9AM Central on Tuesday, Aug 21. I will send the link when I get it.
I believe that Jeff just sent the mock website. (still under construction) and the desk statement.

Thanks
-Ed

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 8/20/2018 1:55:45 PM
To: Grantham, Nancy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=12a3c2ed7158417fb0bb1b1b72a8cfb0-Grantham, Nancy]; Richardson, RobinH [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2fa5c9eb65dc497c81a8dc9ccdb1ffa7-Richardson, RobinH]
Subject: letter
Attachments: ATSDR Sterigenics EtO Consult Letter-final (005).pdf

---

Alison Davis
Acting Director
Policy Analysis & Communications Staff
US EPA, Office of Air Quality Planning & Standards
Research Triangle Park, NC 27711
Desk: 919-541-7587
Mobile: 919-624-0872

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 6/22/2018 12:29:42 AM
To: Sasser, Erika [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=477638fe84004800bfdf8e62fe3cafc8-ESASSER]
CC: Smith, Darcie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3ae3c2377efb42879b943db8796ddc05-Smith, Darcie]; Langdon, Robin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dfd5fbd46a7494c82e49aeb435bfa8d-Langdon, Robin]; Rimer, Kelly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=123a21a46d0e4e53a590798cdcc3fb47-KRIMER]
Subject: Re: Draft news release for Sterigenic

Thanks

Sent from my iPhone

On Jun 21, 2018, at 8:12 PM, Sasser, Erika <Sasser.Erika@epa.gov> wrote:

> Sent from my iPhone
>
> Begin forwarded message:
>
> > **From:** "Nam, Ed" <nam.ed@epa.gov>
> > **Date:** June 21, 2018 at 7:08:18 PM EDT
> > **To:** "Sasser, Erika" <Sasser.Erika@epa.gov>
> > **Subject: FW: Draft news release for Sterigenic**
> >
> > Erika,
> >
> > Sorry I've been tied up all afternoon. I'm guessing you are out of the office by now, but I wanted to send you the latest press release – with some recent edits.
> >
> > Katie sent you the recent website (FAQ), Deliberative Process / Ex. 5
> >
> > Deliberative Process / Ex. 5
> >
> > Thanks,
> > -Ed

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

State of Illinois - CONFIDENTIALITY NOTICE: The information contained in this communication is confidential, may be attorney-client privileged or attorney work product, may constitute inside information or internal deliberative staff communication, and is intended only for the use of the addressee. Unauthorized use, disclosure or copying of this communication or any part thereof is strictly prohibited and may be unlawful. If you have received this communication in error, please notify the sender immediately by return e-mail and destroy this communication and all copies thereof, including all attachments. Receipt by an unintended recipient does not waive attorney-client privilege, attorney work product privilege, or any other exemption from disclosure.

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 10/5/2018 1:54:41 PM
To: Ashley, Jackie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=01a9a3cadfa14c509d09cdae3498dd43-JASHLEY]
Subject: FW: Pager - USE THIS ONE PLEASE
Attachments: NATA Pager for Administrator -Aug 19 Version.2.docx

Importance: High

From: Davis, Alison
Sent: Sunday, August 19, 2018 3:30 PM
To: Koerber, Mike <Koerber.Mike@epa.gov>
Cc: Rimer, Kelly <Rimer.Kelly@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>
Subject: Pager - USE THIS ONE PLEASE
Importance: High

Added line about state complaints to summary

Alison Davis

Senior Advisor for Public Affairs

USEPA, Office of Air Quality Planning & Standards

Research Triangle Park, NC 27711

Tel. 919-541-7587

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 10/5/2018 1:23:12 PM
To: Ashley, Jackie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=01a9a3cadfa14c509d09cdae3498dd43-JASHLEY]
Subject: document 1 of 2
Attachments: Eto and WIllowbrook.Draft briefing paper for Administrator. 10.4.18 with R5 edits .docx

Still waiting on the document from Clint. But this version includes changes from R5 in bold/and shaded

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 8/20/2018 2:54:15 AM
To: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: Files in case - second batch
Attachments: NATA Pager for Administrator -Aug 19 Version.2 MK2.docx; Simple messages.2.docx; EtO Simple Messages for Outreach.DRAFT INTERNAL V3 updated 8.19.16.docx; Draft HIgh Level Talkers for RAs & ADDs.3. notes edit we may need to make .docx; 2014 NATA Overview Fact Sheet. v2. .docx; 2014 NATA Fact Sheet. Version Alison worked from.docx; 2014 NATA Overview Fact Sheet. Editing 2.docx; ETO Fact Sheet Draft. Shows track changes.docx; ETO Fact Sheet Draft.v3.8.18.18z.docx; ETO Fact Sheet Draft.v3.8.18.18.docx

Alison Davis
Senior Advisor for Public Affairs
USEPA, Office of Air Quality Planning & Standards
Research Triangle Park, NC 27711
Tel. 919-541-7587

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 10/2/2018 10:14:50 PM
To: Kelley, Jeff [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e154fa5a5f744c70aa3da58e3f87aabe-JKelley]
Subject: Re: let me know when the page is linked. Thanks!

Thanks!

Alison Davis
Acting Director
Policy Analysis & Communications Staff
US EPA, Office of Air Quality Planning & Standards
Research Triangle Park, NC 27711
Desk: 919-541-7587
Mobile: Personal Phone / Ex. 6

Sent from my iPhone

On Oct 2, 2018, at 6:14 PM, Kelley, Jeff <kelley.jeff@epa.gov> wrote:

> Up under "Stay Informed" on https://www.epa.gov/il/sterigenics-willowbrook-facility
>
> ---
> ***Jeff Kelley***
> *Director, Office of External Communications*
> *U.S. EPA Region 5*
> *ph: 312-353-1159*
>
> ---
>
> **From:** Kelley, Jeff
> **Sent:** Tuesday, October 02, 2018 5:13 PM
> **To:** Davis, Alison <Davis.Alison@epa.gov>
> **Subject:** RE: let me know when the page is linked. Thanks!
>
> She's working on it … I was just pestering her myself!
>
> ---
> ***Jeff Kelley***
> *Director, Office of External Communications*
> *U.S. EPA Region 5*
> *ph: 312-353-1159*
>
> ---
>
> **From:** Davis, Alison
> **Sent:** Tuesday, October 02, 2018 5:12 PM
> **To:** Kelley, Jeff <kelley.jeff@epa.gov>
> **Subject:** let me know when the page is linked. Thanks!

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 8/20/2018 2:53:17 AM
To: Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]
Subject: Files - in case they didn't load to Sharepoint or One Drive
Attachments: 2014 NATA Overview Fact Sheet. v3 MK ENS.docx; EtO Simple Messages for Outreach.DRAFT INTERNAL V3 updated 8.19.18KR.AD MK ENS.docx; NATA Pager for Administrator -Aug 19 Version.2 MK2 (1).docx; NATA Pager for Administrator -Aug 19 Version.2 MK2.docx; NATA Pager for Administrator -Aug 19 Version.2.docx; NATA Pager for Administrator -Aug 19 Version.docx; NATA Pager for Administrator -Aug 17 Version.docx; EtO Simple Messages for Outreach.DRAFT INTERNAL V4 updated 8.19.18.docx; 2014 NATA Overview Fact Sheet. v4.docx; 2014 NATA Overview Fact Sheet. v3 MK.docx; 2014 NATA Overview Fact Sheet. v3.docx; 2014 NATA Overview Fact Sheet. v2KR._.docx; DRAFT Comprehensive QandA.v2.docx; EtO Simple Messages for Outreach.DRAFT INTERNAL V3 updated 8.19.18KR.AD.docx; EtO Simple Messages for Outreach.DRAFT INTERNAL V3 updated 8.19.18KR.docx; Draft HIgh Level Talkers for RAs & ADDs.2 (1).docx; ETO Fact Sheet Draft. Shows track changes KR MK AD.docx; ETO Fact Sheet Draft. Shows track changes KR MK.docx; ETO Fact Sheet Draft.v3.8.18.18z.docx; ETO Fact Sheet Draft.v3.8.18.18.docx; NEI_Report_Trends_Data.zip; Draft HIgh Level Talkers for RAs & ADDs.2.docx; Region 5.20180809-sterigenic_news_release-v2.3.OAQPS.ID.Clean with comments.docx; Region 5.20180809-sterigenic_news_release-v2.3.OAQPS.ID.docx; Draft HIgh Level Talkers for RAs & ADDs.docx; 20180809-sterigenic_news_release-v2.3.OAQPS.ID.docx; ETO Fact Sheet Draft.2.docx; ETO Fact Sheet Draft.docx; Ethylene Oxide - Ambient vs. Source-rrs ens_nbs.docx; Key Messages for quick review.v2PLKB.docx; 2014 NATA Overview Fact Sheet. Editing 2.docx

Alison Davis
Senior Advisor for Public Affairs
USEPA, Office of Air Quality Planning & Standards
Research Triangle Park, NC 27711
Tel. 919-541-7587

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 10/5/2018 6:11:01 PM
To: Rimer, Kelly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=123a21a46d0e4e53a590798cdcc3fb47-KRIMER]
Attachments: Ethylene oxide in Willowbrook.Status and Next Steps.10.4.18.docx; How is the ATSDR Letter Different from the National Air Toxics Assessment.docx

Mayor Trilla,

Attached is some information for you about the differences between the ATSDR letter and our National Air Toxics Assessment, along with a status and next steps update. I welcome your feedback; please let me know if you want more detail. We plan to post the status document on our website early next week.

Please don't hesitate to call if you have any questions.

Sincerely,
Kelly Rimer
U.S. EPA Office of Air Quality Planning & Standards
919-541-5368

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 10/3/2018 10:42:24 PM
To: Sasser, Erika [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=477638fe84004800bfdf8e62fe3cafc8-ESASSER]; Rimer, Kelly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=123a21a46d0e4e53a590798cdcc3fb47-KRIMER]; Darcie Smith (Smith.Darcie@epa.gov) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3ae3c2377efb42879b943db8796ddc05-Smith, Darcie]; Shappley, Ned [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5fc7fde372054ab5ac38f24b9072b73d-Shappley, N]; Koerber, Mike [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9c513901d4fd49f9ab101a6f7a7a863e-Koerber, Mike]
CC: Jones, Enesta [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=65b8e6c6e5ca4a7a9ae85d98a4c8eedb-EJones02]; Riha, Kristin [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=bafc89833bc04298ba8bf264d49f7d26-Riha, Kristin]; Lessard, Patrick [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=936faef361044e1087b6ca18d92b4cca-Lessard, Pa]
Subject: RE: Draft update document for Acting Administrator Wheeler
Attachments: Eto and WIllowbrook.Draft briefing paper for Administrator. 10.3.18.docx

Sorry all. With attachment this time.

From: Davis, Alison
Sent: Wednesday, October 03, 2018 6:42 PM
To: Sasser, Erika <Sasser.Erika@epa.gov>; Rimer, Kelly <Rimer.Kelly@epa.gov>; Darcie Smith (Smith.Darcie@epa.gov) <Smith.Darcie@epa.gov>; Shappley, Ned <Shappley.Ned@epa.gov>; Koerber, Mike <Koerber.Mike@epa.gov>
Cc: Jones, Enesta <Jones.Enesta@epa.gov>; Riha, Kristin <Riha.Kristin@epa.gov>; Lessard, Patrick <Lessard.Patrick@epa.gov>
Subject: Draft update document for Acting Administrator Wheeler

Thanks all for your help. This went to Clint. Will let you know if he has questions/edits.

Message

From: Davis, Alison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=1C309F42D5D44D18A52B027BD0112778-ADAVIS06]
Sent: 10/2/2018 7:42:47 PM
To: Rimer, Kelly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=123a21a46d0e4e53a590798cdcc3fb47-KRIMER]
Subject: Fwd: EPA Sterigenics webpage

Alison Davis
Acting Director
Policy Analysis & Communications Staff
US EPA, Office of Air Quality Planning & Standards
Research Triangle Park, NC 27711
Desk: 919-541-7587
Mobile: Personal Phone / Ex. 6

Sent from my iPhone

Begin forwarded message:

> **From:** "Koerber, Mike" <Koerber.Mike@epa.gov>
> **Date:** October 2, 2018 at 3:41:34 PM EDT
> **To:** "Davis, Alison" <Davis.Alison@epa.gov>, "Bremer, Kristen" <Bremer.Kristen@epa.gov>
> **Subject: Fwd: EPA Sterigenics webpage**
>
> Sent from my iPhone
>
> Begin forwarded message:
>
> > **From:** "Nam, Ed" <nam.ed@epa.gov>
> > **Date:** October 2, 2018 at 2:33:09 PM EDT
> > **To:** Mayor Mickey <Mickey@mayormickey.com>
> > **Cc:** "Koerber, Mike" <Koerber.Mike@epa.gov>
> > **Subject: RE: EPA Sterigenics webpage**
> >
> > Hi Mayor Mickey,
> >
> > It was really great to meet you last week. Thanks for reaching out. I'm sure you'll get a response from Cathy soon, but I also wanted to let you know that we are working on that language now and hope to release it soon. I'm cc'ing Mike Koerber as well as his team is managing the risk communication.
> >
> > Thanks,
> > -Ed
> >
> > -Edward Nam
> > Director, Air and Radiation Division
> > US EPA, Region 5, Mail code A-18J

77 W. Jackson Blvd.
Chicago, IL 60604-3590
Phone 312-353-2192 nam.ed@epa.gov

From: Mayor Mickey [mailto:Mickey@mayormickey.com]
Sent: Tuesday, October 02, 2018 12:48 PM
To: Nam, Ed <nam.ed@epa.gov>
Subject: FW: EPA Sterigenics webpage

Hi Ed,

It was great to meet you last week and I look forward to next time! I just wanted to keep you in the loop…please see below. Unless I am missing something, this update is missing critical information and I think will do nothing but fuel fear across the community!

And for your information, law firms are now holding workshops in our town to teach people how to sue Sterigenics. Welcome to Illinois!

All the best, Mickey

Mickey Straub
Mayor | Village of Burr Ridge
7660 S. County Line Road, Burr Ridge, IL 60527
MStraub@Burr-Ridge.gov
Mickey@MayorMickey.com
Village: 630-654-8181

From: Mayor Mickey <Mickey@mayormickey.com>
Sent: Tuesday, October 2, 2018 12:13 PM
To: 'Stepp, Cathy' <stepp.cathy@epa.gov>
Cc: 'Evan Walter' <EWalter@burr-ridge.gov>; Douglas Pollock <DPOLLOCK@BURR-RIDGE.GOV>
Subject: RE: EPA Sterigenics webpage

Dear Cathy,

Thank you for the update, but it appears to me that additional information and clarification is necessary? I think this excerpt will likely just increase the health scare, unless it included more details as to what level of exposure is necessary:

> "ATSDR concluded: "if measured and modeled data represent typical ethylene oxide ambient concentrations in ambient air, an elevated cancer risk exists for residents and offsite workers in the Willowbrook community surrounding the Sterigenics facility. These elevated risks present a public health hazard to these populations."

For example, one of your high ranking EPA officials told me that the cancer risk was only greater assuming you were sitting in a lawn chair with "70 years of exposure 24 hours per day". Why wasn't something like that clearly specified?

Also, why weren't the results of the most recent Stack Test included and explained in layman's terms. (Pardon me if I missed them.)

Thank you for your efforts.

All the best, Mickey

Mickey Straub
Mayor | Village of Burr Ridge
7660 S. County Line Road, Burr Ridge, IL 60527
MStraub@Burr-Ridge.gov
Mickey@MayorMickey.com
Village: 630-654-8181

From: Stepp, Cathy <stepp.cathy@epa.gov>
Sent: Tuesday, October 2, 2018 11:24 AM
To: clarisol_duque@durbin.senate.gov; jasmine_hunt@durbin.senate.gov; Tran_Nguyen@durbin.senate.gov; david_applegate@duckworth.senate.gov; Radha_adhar@duckworth.senate.gov; Hilary.Denk@mail.house.gov; Gary.Timmins@mail.house.gov; Samantha.warren@mail.house.gov; Joe.Fawell@mail.house.gov; lee.campuzano@mail.house.gov; hannah.chargin@mail.house.gov; joel.creswell@mail.house.gov; sam.pfister@illinois.gov; brian.oszakiewski@mail.house.gov; kweaver@darienil.gov; bvana@darienil.gov; senatorcurran@gmail.com; repdurkin@hotmail.com; durkin@ilhousegop.org; ftrilla@willowbrook.il.us; Mickey@MayorMickey.com; dpollock@burr-ridge.gov; alec.messina@illinois.gov; laura.roche@illinois.gov; Julie.Armitage@illinois.gov; lissa@serafin.com; rcipriano@schiffhardin.com; mmahoney@hrs.ilga.gov; greg.hart@dupageco.org; Lise.T.Spacapan@illinois.gov; patty.schuh@illinois.gov; Dan.Cronin@dupageco.org; Cynthia_Bajjalieh@durbin.senate.gov; marina_faz-huppert@duckworth.senate.gov; bill.dart@illinois.gov
Cc: Thiede, Kurt <thiede.kurt@epa.gov>; Payne, James <payne.james@epa.gov>
Subject: EPA Sterigenics webpage

Good Morning –

I wanted to let you all know the EPA Sterigenics webpage has been expanded to include additional information to help explain the work being done in and around the Sterigenics facility in Willowbrook, IL. Thank you all for your attention to this matter, as well as your willingness to work with us to understand how best to communicate to the community.

The webpage can be found at: https://www.epa.gov/il/sterigenics-willowbrook-facility

Thank you,

Cathy Stepp
Regional Administrator

Appointment

From: Rimer, Kelly [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=123A21A46D0E4E53A590798CDCC3FB47-KRIMER]
Sent: 10/17/2018 7:29:50 PM
To: Rimer, Kelly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=123a21a46d0e4e53a590798cdcc3fb47-KRIMER]; Weinstock, Lewis [Weinstock.Lewis@epa.gov]; Vasu, Amy [Vasu.Amy@epa.gov]; Morris, Mark [Morris.Mark@epa.gov]; Thurman, James [Thurman.James@epa.gov]
CC: Koerber, Mike [Koerber.Mike@epa.gov]; Shappley, Ned [Shappley.Ned@epa.gov]; Fox, Tyler [Fox.Tyler@epa.gov]; Bremer, Kristen [Bremer.Kristen@epa.gov]; Davis, Alison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1c309f42d5d44d18a52b027bd0112778-ADAVIS06]; Hollingsworth, Terri [Hollingsworth.Terri@epa.gov]

Subject: Prep for call with Willowbrook
Attachments: image2018-10-15-164142.pdf
Location: RTP-C500A-Max40/RTP-Bldg-C PH: RTP-OAQPS Personal Phone / Ex. 6

Start: 10/22/2018 7:00:00 PM
End: 10/22/2018 8:00:00 PM
Show Time As: Tentative

Question 1: Amy

Question 2: Lew, Kelly

Question 3: Mark

Question 4: Kelly

Question 5: Kelly

Question 6: James, Lew

Feel free to bring or forward to others that should be involved in the discussions.

Message

From: McLamb, Marguerite [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=85F0F472928E4767965C94E609FEDC45-MCLAMB, MARGUERITE]
Sent: 10/22/2018 2:36:34 PM
To: Lassiter, Penny [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c3f6bf2e31d4492b9658b7c5c1583c09-PLASSITE]
Subject: FW: For Monday 10/22 COB: FW: CONGRESSIONAL: Request: drafting and feedback on response to Sens. Durbin & Duckworth and Rep. Foster regarding ethylene oxide generally and Willowbrook, IL
Attachments: 18.10.11 - Letter to EPA Office of Air and Radiation re clean air - Whee....pdf; EPA response to Sens. Durbin and Duckworth Rep. Foster on EtO in Willowbrook AL-19-00 SPPD0-0435.docx

Importance: High

Hi, Penny,
Just following up on this, particularly regarding information about facility-specific actions we can provide.
Thanks,
Marguerite

From: McLamb, Marguerite
Sent: Friday, October 19, 2018 10:55 AM
To: Cozzie, David <Cozzie.David@epa.gov>; Lassiter, Penny <Lassiter.Penny@epa.gov>
Cc: Fred Thompson <Thompson.Fred@epa.gov>
Subject: For Monday 10/22 COB: FW: CONGRESSIONAL: Request: drafting and feedback on response to Sens. Durbin & Duckworth and Rep. Foster regarding ethylene oxide generally and Willowbrook, IL
Importance: High

David and Penny,

We've been asked to provide feedback on a written response by COB Monday to a Congressional letter involving EtO and including senators whose staffers' questions we were fielding earlier in the week. **Deliberative Process / Ex. 5**

Deliberative Process / Ex. 5

Thanks,
Marguerite

From: Terry, Sara
Sent: Friday, October 19, 2018 10:38 AM
To: Rimer, Kelly <Rimer.Kelly@epa.gov>; Koerber, Mike <Koerber.Mike@epa.gov>; Wayland, Richard <Wayland.Richard@epa.gov>; Weinstock, Lewis <Weinstock.Lewis@epa.gov>; McLamb, Marguerite <McLamb.Marguerite@epa.gov>; Sasser, Erika <Sasser.Erika@epa.gov>
Cc: Ashley, Jackie <Ashley.Jackie@epa.gov>
Subject: CONGRESSIONAL: Request: drafting and feedback on response to Sens. Durbin & Duckworth and Rep. Foster regarding ethylene oxide generally and Willowbrook, IL
Importance: High

Hi all,

If you want to send me your comments, I can consolidate them into a unified OAQPS response. I think our main input is in the first few paragraphs. We have specifically been asked to:

1. Edit/enhanced statement re: continuous monitoring for EtO (so have included Chet and Lew), and
2. What we are doing re: facilities, if anything more than the language we have already provided

If you can get me your comments by COB Monday, I will send up Tuesday.
Sara

From: Davis, Matthew
Sent: Thursday, October 18, 2018 5:07 PM
To: Deamer, Eileen <deamer.eileen@epa.gov>; Linkins, Samantha <Linkins.Samantha@epa.gov>; Kaiser, Sven-Erik <Kaiser.Sven-Erik@epa.gov>; Ashley, Jackie <Ashley.Jackie@epa.gov>; Terry, Sara <Terry.Sara@epa.gov>; Rimer, Kelly <Rimer.Kelly@epa.gov>; Koerber, Mike <Koerber.Mike@epa.gov>; Nam, Ed <nam.ed@epa.gov>
Cc: Haman, Patricia <Haman.Patricia@epa.gov>; Moody, Christina <Moody.Christina@epa.gov>; Lubetsky, Jonathan <Lubetsky.Jonathan@epa.gov>; Mroz, Jessica <mroz.jessica@epa.gov>
Subject: Request: drafting and feedback on response to Sens. Durbin & Duckworth and Rep. Foster regarding ethylene oxide generally and Willowbrook, IL

Hello All,
I hope you had a good Thursday. I'm getting in touch for your help responding to the attached incoming from Sens. Durbin and Duckworth, and Rep. Foster on general/national ethylene oxide and related Willowbrook, IL topics. I've made a first cut at the broad paragraphs that this should include and some specific suggested text for the things I know more about. I have specifically called out the AAship or regional office as much as possible, but I encourage you to look at all and weigh in wherever appropriate. Please take a look and work on edits and drafting text to get back to me by Tuesday 10/23/18 COB (or earlier if possible). I'm going to be running point on this letter, and will hold onto it in CMS, so we'll do our back and forth with text and edits over email, and I'll compile suggestions.
By mid- next week, once we've got a pretty solid draft, I'll ask you all to review and send up your management chains for approval.
Please let me know if you have any questions.
Thank you in advance for your help on this,
Matthew

Matthew Davis
Office of Congressional Affairs
U.S. Environmental Protection Agency
1200 Pennsylvania Ave, NW, MC-1301A
Washington, DC 20460
(202) 564-1267

Message

From: Lavoie, Tegan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=EB301A7C4E8F47EF898C1DAB1DCF4E3B-LAVOIE, TEG]
Sent: 10/13/2017 6:55:31 PM
To: Lassiter, Penny [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c3f6bf2e31d4492b9658b7c5c1583c09-PLASSITE]
Subject: EtO Pager
Attachments: EtO Pager for Mike K and DDs 10 05 17_TL.docx

Hi Penny,

Please see my updates to the EtO Pager attached. Please make sure you have "Track Changes" turned on so I can more easily incorporate them back into the SharePoint document.

I have found permits for 27 of the 29 high EtO risk facilities. The two facilities without permits (Pelron Corp, Lyons, IL and Ashland Specialty Ingredients, Parlin, NJ) either are not subject to Title V Permitting, or their permits are not posted online. I will contact the regions to see if permits are available.

Deliberative Process / Ex. 5

Please let me know if you have any questions.

Best,
Tegan

Tegan N. Lavoie, PhD | Physical Scientist
OAR/OAQPS/SPPD/Refining and Chemicals Group
U.S. Environmental Protection Agency
109 TW Alexander Drive, Office: E142G, MC:E143-01
Research Triangle Park, NC 27711
Phone: (919) 541-5110 | Email: lavoie.tegan@epa.gov

Message

From: Eck, Janet [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F044E2781E1647468EE16FBFAB8D55B2-JECK]
Sent: 9/27/2018 4:37:08 PM
To: Lassiter, Penny [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c3f6bf2e31d4492b9658b7c5c1583c09-PLASSITE]
Subject: RE: Stakeholder Sign in Sheet: 9/26/2018 Meeting with Sterigenics

Thanks Penny.

From: Lassiter, Penny
Sent: Thursday, September 27, 2018 11:52 AM
To: Eck, Janet <Eck.Janet@epa.gov>
Cc: Barnett, Keith <Barnett.Keith@epa.gov>; Dunkins, Robin <Dunkins.Robin@epa.gov>; French, Chuck <French.Chuck@epa.gov>; Fruh, Steve <Fruh.Steve@epa.gov>; Garwood, Gerri <Garwood.Gerri@epa.gov>; Hutson, Nick <Hutson.Nick@epa.gov>; Lamason, Bill <Lamason.Bill@epa.gov>; Conner, Lisa <Conner.Lisa@epa.gov>; Culligan, Kevin <Culligan.Kevin@epa.gov>; McLamb, Marguerite <McLamb.Marguerite@epa.gov>; Pemberton, Wanda <Pemberton.Wanda@epa.gov>; Srivastava, Ravi <Srivastava.Ravi@epa.gov>; Thompson, Fred <Thompson.Fred@epa.gov>
Subject: Re: Stakeholder Sign in Sheet: 9/26/2018 Meeting with Sterigenics

I believe he was a member of the Trump administration's transition team at DOE. He is now a lobbyist with MWR Strategies on energy issues associated with EGUs and O&G.

Sent from my iPhone

On Sep 27, 2018, at 11:13 AM, Eck, Janet <Eck.Janet@epa.gov> wrote:

> Please let me know if you are familiar w/Mike McKenna for any of your rulemakings. Alan has an OAR meeting sign-in sheet from David Harlow for the docket, but he isn't sure which rulemaking this is associated with. Thanks for your help.
>
> ---
>
> **From:** Rush, Alan
> **Sent:** Thursday, September 27, 2018 10:54 AM
> **To:** Eck, Janet <Eck.Janet@epa.gov>
> **Cc:** Iglesias, Amber <Iglesias.Amber@epa.gov>; Henigin, Mary <Henigin.Mary@epa.gov>
> **Subject:** Fw: Stakeholder Sign in Sheet: 9/26/2018 Meeting with Sterigenics
>
> Janet,
>
> Attached is a sign in sheet for a meeting with Sterigenics. This should probably go with the Ethylene rule.
>
> Alan
>
> I also have one for a meeting with Mike McKenna, do you have any idea what rulemaking that would accompany? He met with David Harlow.
>
> Alan

From: Atkinson, Emily
Sent: Thursday, September 27, 2018 10:45 AM
To: Rush, Alan; Iglesias, Amber; Culligan, Kevin
Subject: Stakeholder Sign in Sheet: 9/26/2018 Meeting with Sterigenics

Emily Atkinson
Special Assistant
Management Analyst
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5406E, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

Message

From: Caparoso, Jennifer [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=78412D4056534EF288FB8CE390B4BF17-CAPAROSO, J]
Sent: 7/24/2018 11:23:59 AM
To: Lassiter, Penny [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c3f6bf2e31d4492b9658b7c5c1583c09-PLASSITE]
Subject: info for 3:00 p.m. special purpose call
Attachments: 2014 NATA Results by Region.pptx; 2014 NATA Results Summary_Special Purpose Call.pptx

Purpose: To discuss potential EtO health risks identified through NATA results, and next steps in the NATA process.

Message

From: Rimer, Kelly [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=123A21A46D0E4E53A590798CDCC3FB47-KRIMER]
Sent: 7/17/2018 2:07:51 PM
To: OAQPS SPPD GL [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=cd5092d1632447dda66a98b524194b89-OAQPS SPPD GL]; OAQPS SPPD GL [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=cd5092d1632447dda66a98b524194b89-OAQPS SPPD GL]
Subject: FW: Agenda/Meeting Materials in Prep for Tomorrow's Meetings
Attachments: 1_2017 Design Values Highlights and Table 7_17_18.docx; 2_a_MSW Landfills 07_17_18.docx; 2_b_i_OAQPS-quick facts AD 07_17_18.pptx; 2_b_ii_OAQPS Org 07_17_18.pptx; 3_a_i_EtO discussion with Regions 3-6 07_17_18.docx; 3_a_ii_NATA Results Summary for Regions 3 4 5 6.pptx; 3_b_Grain Elevators NSPS 07_17_18.docx; 4_a_Marine Vessel Loading 07_17_18.docx; 4_b_Biomass Update AD 07_17_18.docx; 5_i_NOxSOxPM ISA Overview 07_17_18.pptx; 5_ii_NOx SOx PM_NAAQS_review_pager 07_17_18.docx; 6_c_i_Title V Petitions update DH 07_17_18.pptx; 6_c_ii_Upcoming Title V Pet Dates 07_17_18.docx; 6_b_Res Wood Heater Update AD 07_17_18.pptx; 7_a_EGU RTR Modeling Sum 07_17_18.docx; 7_b_Press Rel Dev AD 07_17_18.docx; 6_a_i_SSM SIP Analysis 7_17_18.DOCX; 6_a_ii_Table 1_Regional Characterization of PendingSIP Actions_2018-07-13.pdf; 6_a_iii_Table 2 _ Regional Char of Pending SIP Actions 07_17_18.pdf; 6_a_iv_Table 3_Regional Characterization of Pending SIP Actions_2018-07-13_StateCount_sort on Court.pdf; 0_Final Agenda BW visit RTP 07_17.docx

FYI

From: South, Peter
Sent: Monday, July 16, 2018 4:56 PM
To: Cozzie, David <Cozzie.David@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>; Harnett, Bill <Harnett.Bill@epa.gov>; Koerber, Mike <Koerber.Mike@epa.gov>; Noonan, Jenny <Noonan.Jenny@epa.gov>; Sasser, Erika <Sasser.Erika@epa.gov>; Wayland, Richard <Wayland.Richard@epa.gov>; Whitlow, Jeff <Whitlow.Jeff@epa.gov>; Wood, Anna <Wood.Anna@epa.gov>
Cc: OAQPS SMT2 <OAQPS_SMT2@epa.gov>; Mills, Kathy <Mills.Kathy@epa.gov>; Ashley, John <ashley.john@epa.gov>; Cortelyou-Lee, Jan <Cortelyou-Lee.Jan@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>; Ashley, Jackie <Ashley.Jackie@epa.gov>; Johnson, Yvonne W <Johnson.Yvonnew@epa.gov>; Long, Pam <Long.Pam@epa.gov>; Riha, Kristin <Riha.Kristin@epa.gov>
Subject: Agenda/Meeting Materials in Prep for Tomorrow's Meetings

FYI

0_Final Agenda BW visit RTP 07...

	Bill W	***Mandy***	***David***	***Alex***
8:30 to 9:00	2017 Design Value Update 1_2017 Design Values Highlight...			
9:00 to 9:45	Municipal Solid Waste Landfills			OAQPS Overview with PACS

	2_a_MSW Landfills 07_17_18.docx		2_b_i_OAQPS-q... facts AD 07_17_... 2_b_ii_OAQPS Org 07_17_18.pptx
10:00 to 10:45	EtO with RAs (HEID) 3_a_i_EtO discussion with ... 3_a_ii_NATA Results Summar...		Grain Elevators Backgrounder 3_b_Grain Elevators NSPS ...
11:00 to 11:45	Marine Vessel Loading 4_a_Marine Vessel Loading 07_17_1...		Biomass Backgrounder 4_b_Biomass Update AD 07_1...
12:00 to 12:45	*Lunch*		
1:00 to 1:45	NOx/SOx Secondary NAAQS Review (second draft ISA) 5_i_NOxSOxPM ISA Overview 07... 5_ii_NOx SOx PM_NAAQS_revi...		
2:00 to 2:45	SSM 6_a_i_SSM SIP Analysis 7_17_1... 6_a_ii_Table 1_Regional Char... 6_a_iii_Table 2 _ Regional Char of... 6_a_iv_Table 3_Regional Char...	Title V 6_c_i_Title V Petitions update ... 6_c_ii_Upcoming Title V Pet Dates...	Wood Heaters Backgrounder 6_b_Res Wood Heater Update A...
3:00 to 3:45	MATS Update 7_a_EGU RTR Modeling Sum 0...		Pressure Relief Devices Backgrounder 7_b_Press Rel Dev AD 07_17_18.docx
3:45 to 5:00	OAR Business Review		Open

Message

From: Caparoso, Jennifer [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=78412D4056534EF288FB8CE390B4BF17-CAPAROSO, J]
Sent: 9/17/2018 6:07:39 PM
To: Witt, Jon [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ea00bc6f645b438682026a77a8d4267c-Witt, Jonat]
CC: Fruh, Steve [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f47a02a00d3642aea6de691e3015b188-SFRUH]; Lassiter, Penny [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c3f6bf2e31d4492b9658b7c5c1583c09-PLASSITE]
Subject: RE: EtO action items

Hi Jonathan,

Kelly Rimer called me a few minutes ago and asked if I was setting up the call. I told her I was not since it is a sterilizer. My suggestion is for FIG to take the lead with assistance from AQAD/MTG and involvement from HEID/ATAG.

Please call me at Personal Phone / Ex. 6 if you would like additional information.

Thank you,

Jennifer

From: Lassiter, Penny
Sent: Monday, September 17, 2018 1:41 PM
To: Witt, Jon <Witt.Jon@epa.gov>
Cc: Fruh, Steve <Fruh.Steve@epa.gov>; Caparoso, Jennifer <Caparoso.Jennifer@epa.gov>
Subject: RE: EtO action items

Jon- I don't know about that. I'm cc'ing Jennifer in case she heard anything that she can share.

From: Witt, Jon
Sent: Monday, September 17, 2018 1:26 PM
To: Lassiter, Penny <Lassiter.Penny@epa.gov>
Cc: Fruh, Steve <Fruh.Steve@epa.gov>
Subject: RE: EtO action items

Thanks, Penny. Was there any word on the call between OAR and Sterigenics?

From: Lassiter, Penny
Sent: Monday, September 17, 2018 1:20 PM
To: Witt, Jon <Witt.Jon@epa.gov>
Cc: Fruh, Steve <Fruh.Steve@epa.gov>
Subject: FW: EtO action items

Wanted to share this email string with you since most if of has more to do with sterilizers that with chem sector, except the discussion at the end of Mike's message regarding fugitives monitoring at Solvay.

Thanks.

From: Rimer, Kelly
Sent: Monday, September 17, 2018 12:55 PM
To: Koerber, Mike <Koerber.Mike@epa.gov>; Caparoso, Jennifer <Caparoso.Jennifer@epa.gov>; Lassiter, Penny <Lassiter.Penny@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>; Shappley, Ned <Shappley.Ned@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>; Cortelyou-Lee, Jan <Cortelyou-Lee.Jan@epa.gov>
Cc: Sasser, Erika <Sasser.Erika@epa.gov>; Cozzie, David <Cozzie.David@epa.gov>; Wayland, Richard <Wayland.Richard@epa.gov>
Subject: RE: EtO action items

Hi Mike,

Here is a status of the action items from ATAG:

The ATSDR meeting will be this Thursday at 10 am. It should be on your calendar. There is a pre-meeting with R5 staff only on Wednesday afternoon at 2:30 that I forwarded to you as well.

We are working with AQAD and PACS on the plan for what to discuss and messaging for the mtg with the elected officials – will have something to you late Monday or Tuesday morning.

Deliberative Process / Ex. 5

Thanks,
Kelly

From: Koerber, Mike
Sent: Friday, September 14, 2018 10:31 AM
To: Caparoso, Jennifer <Caparoso.Jennifer@epa.gov>; Lassiter, Penny <Lassiter.Penny@epa.gov>; Rimer, Kelly <Rimer.Kelly@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>; Shappley, Ned <Shappley.Ned@epa.gov>; Davis, Alison <Davis.Alison@epa.gov>; Cortelyou-Lee, Jan <Cortelyou-Lee.Jan@epa.gov>
Cc: Sasser, Erika <Sasser.Erika@epa.gov>; Cozzie, David <Cozzie.David@epa.gov>; Wayland, Richard <Wayland.Richard@epa.gov>
Subject: EtO action items

After talking with Clint yesterday, he's asked that we do the following:

- Set-up meeting/phone call between OAR and Sterigenics. Please reach out the appropriate person in Sterigenics, such as Kathy Hoffman – or do you have another contact? It would be good to have this meeting next week, if possible.

- Set-up meeting/phone call between OAR and ATSDR. This should be with folks at the ATSDR Headquarters level. This meeting, too, would be good to have next week, if possible.

- Begin to get ready for the small meeting with elected officials in Chicago, which will possibly be next week. For example, let's draft our plan for what we want to discuss and appropriate messaging. Also, Clint just received a draft pager from ORD on their IRIS assessment, which he will share with us. **Deliberative Process / Ex. 5**
Deliberative Process / Ex. 5

Also, I talked with him about fugitives monitoring for Solvay and sharing NATA modeling results in response to requests from Regions and states. I will call Beverly to discuss the Solvay situation. **Deliberative Process / Ex. 5**

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5 It might be good to talk first before we actually send anything out.

Please let me know if you have questions about any of this.

Mike

Message

From: Lassiter, Penny [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=C3F6BF2E31D4492B9658B7C5C1583C09-PLASSITE]
Sent: 10/16/2017 2:48:39 PM
To: Lavoie, Tegan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eb301a7c4e8f47ef898c1dab1dcf4e3b-Lavoie, Teg]
Subject: RE: EtO Pager
Attachments: EtO Pager for Mike K and DDs 10 16 17_TL_PL.DOCX

Tegan,

My edits. Please check all the numbers I included. This may be more than Darcie is looking for, but I thought it would be helpful. Also, see my comment in the bubble.

Penny Lassiter
Group Leader
Refining and Chemicals Group
SPPD/OAQPS
U.S. Environmental Protection Agency
Mail Code: E143-01
Research Triangle Park, NC 27711
(919) 541-5396
lassiter.penny@epa.gov

From: Lavoie, Tegan
Sent: Friday, October 13, 2017 2:56 PM
To: Lassiter, Penny <Lassiter.Penny@epa.gov>
Subject: EtO Pager

Hi Penny,

Please see my updates to the EtO Pager attached. Please make sure you have "Track Changes" turned on so I can more easily incorporate them back into the SharePoint document.

I have found permits for 27 of the 29 high EtO risk facilities. The two facilities without permits (Pelron Corp, Lyons, IL and Ashland Specialty Ingredients, Parlin, NJ) either are not subject to Title V Permitting, or their permits are not posted online. I will contact the regions to see if permits are available.

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Please let me know if you have any questions.

Best,
Tegan

Tegan N. Lavoie, PhD | Physical Scientist
OAR/OAQPS/SPPD/Refining and Chemicals Group
U.S. Environmental Protection Agency
109 TW Alexander Drive, Office: E142G, MC:E143-01
Research Triangle Park, NC 27711
Phone: (919) 541-5110 | Email: lavoie.tegan@epa.gov

Message

From: Lassiter, Penny [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=C3F6BF2E31D4492B9658B7C5C1583C09-PLASSITE]
Sent: 8/1/2017 4:23:57 PM
To: Lavoie, Tegan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eb301a7c4e8f47ef898c1dab1dcf4e3b-Lavoie, Teg]
CC: Brenda Shine [Shine.Brenda@epa.gov]; Art Diem (Diem.Art@epa.gov) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=968850b28af04c6a828006016a28cf22-ADIEM]; Andrew Bouchard [Bouchard.Andrew@epa.gov]; Carey, Angela [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=48912f4f4ecf4bc399bd91c8daede5b3-Carey, Ange]
Subject: FW: EtO Pager for Mike K and DDs 08 01 17.docx
Attachments: EtO Pager for Mike K and DDs 08 01 17.docx

FYI.

Penny Lassiter
Group Leader
Refining and Chemicals Group
SPPD/OAQPS
U.S. Environmental Protection Agency
Mail Code: E143-01
Research Triangle Park, NC 27711
(919) 541-5396
lassiter.penny@epa.gov

From: French, Chuck
Sent: Tuesday, August 01, 2017 11:49 AM
To: Cozzie, David <Cozzie.David@epa.gov>; Lassiter, Penny <Lassiter.Penny@epa.gov>
Subject: FW: EtO Pager for Mike K and DDs 08 01 17.docx

From: Rimer, Kelly
Sent: Tuesday, August 1, 2017 11:34 AM
To: French, Chuck <French.Chuck@epa.gov>; Shrager, Brian <Shrager.Brian@epa.gov>; Goehl, Eric <Goehl.Eric@epa.gov>
Subject: EtO Pager for Mike K and DDs 08 01 17.docx

FYI here is the EtO pager for today.

Thanks,
Kelly

Message

From: Lassiter, Penny [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=C3F6BF2E31D4492B9658B7C5C1583C09-PLASSITE]
Sent: 9/21/2018 7:16:34 PM
To: Witt, Jon [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ea00bc6f645b438682026a77a8d4267c-Witt, Jonat]
CC: Steve Fruh [Fruh.Steve@epa.gov]
Subject: FW: News stories today - Willowbrook

From: Davis, Alison
Sent: Friday, September 21, 2018 2:14 PM
To: Koerber, Mike <Koerber.Mike@epa.gov>; Sasser, Erika <Sasser.Erika@epa.gov>; Rimer, Kelly <Rimer.Kelly@epa.gov>; Lassiter, Penny <Lassiter.Penny@epa.gov>; Smith, Darcie <Smith.Darcie@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; Weinstock, Lewis <Weinstock.Lewis@epa.gov>; Shappley, Ned <Shappley.Ned@epa.gov>; Caparoso, Jennifer <Caparoso.Jennifer@epa.gov>; Jones, Rhea <Jones.Rhea@epa.gov>; Riha, Kristin <Riha.Kristin@epa.gov>; Truesdell, Raymond <truesdell.raymond@epa.gov>; Strum, Madeleine <Strum.Madeleine@epa.gov>; Mckelvey, Laura <Mckelvey.Laura@epa.gov>; Mills, Kathy <Mills.Kathy@epa.gov>
Cc: Cortelyou-Lee, Jan <Cortelyou-Lee.Jan@epa.gov>; Ashley, Jackie <Ashley.Jackie@epa.gov>; Terry, Sara <Terry.Sara@epa.gov>
Subject: News stories today - Willowbrook

https://patch.com/illinois/burrridge/chicago-firm-files-law-suit-against-sterigenics

Cancer Patient Sues Sterigenics Amid Nearly Decade-Long Battle

A law firm is representing plaintiff Ryan Feeney, a 26-year-old who was diagnosed with Non-Hodgkin's lymphoma.

By Andrea Earnest, Patch Staff | Sep 20, 2018 2:44 pm ET | Updated Sep 20, 2018 4:59 pm ET

WILLOWBROOK, IL — A Chicago law firm announced Thursday it has filed a lawsuit against Sterigenics International Inc., for civil battery, negligence and public nuisance for knowingly emitting ethylene oxide.

Sterigenics uses ethylene oxide to sterilize medical equipment and other products. The sterilization process emits ethylene oxide, and a report from the U.S. National Cancer Institute notes, "Exposure to (ethylene oxide) is highly irritating to the eyes, skin and respiratory tract, induces nausea and vomiting and causes central nervous system depression. Ethylene oxide is mutagenic in humans and chronic exposure is associated with an increased risk of leukemia, stomach cancer, pancreatic cancer and non-Hodgkin lymphoma."

The Chicago based firm, Romanucci & Blandin, LLC and Hart McLaughlin & Eldridge are representing plaintiff Ryan Feeney, a 26-year-old who was diagnosed with Non-Hodgkin's lymphoma.

Willowbrook families retained the law firm after a report came out last month, detailing the risks of the ethylene oxide emissions to the community. A report from the Agency for Toxic Substances and Disease Registry, which is a division of the CDC, stated, "If measured and modeled data represent typical EtO ambient concentrations in ambient air, an elevated cancer risk exists for residents and off-site workers in the Willowbrook community surrounding the Sterigenics facility. These evaluated risks present a public health hazard to these populations."

"Neither the extent of Sterigenics' ethylene oxide emissions nor the impact of those emissions on the health of those who live and work in the Willowbrook community was known by the general public until the ATSDR

released their report on Aug. 21, and the Aug. 22, 2018 release of the EPA's 2014 National Air Toxics Assessment," Antonio Romanucci, principal and partner at Romanucci & Blandin, LLC, said in a release.

The law firm said that according to data from air samples taken by the EPA in 2018, the Willowbrook census tract posts a cancer risk that is 64 times higher than the EPA's acceptable limits and is in the 99.9th percentile in terms of cancer risk in the country.

The complaint, which has been filed in the Circuit Court of DuPage County, states that Feeney has lived in close proximity of Sterigenics for 22 years and also attended Hinsdale South High School, which is within a one-mile radius of the facility, according to a release from the law firm. Feeney was diagnosed with Non-Hodgkin's Lymphoma in 2010.

The law firm said in a release Feeney was not aware he was at risk of cancer or that his cancer diagnosis was a result of Sterigenics' emissions of ethylene oxide until after a confirming report was released from the U.S. Department of Health and Human Services Agency for Toxic Substances and Disease Registry.

"The potential ramifications of this revelation are catastrophic – the EPA has reported that human exposure to ethylene oxide causes cancer, and numerous other serious health risks, such as DNA mutations and birth defects," Romanucci said in a release. "Ryan Feeney and others who live, work, or have children attending school in and around Willowbrook, including several with cancer or with relatives who have died of cancer, have retained our law firms to investigate the harmful effects of this toxic exposure. Our goal in filing this lawsuit is to hold Sterigenics accountable for their reckless negligence that resulted in the needless and continuous poisoning of men, women and children."

Image via Google Streetview.

Press release on lawsuit

https://www.biospace.com/article/releases/willowbrook-families-file-lawsuit-against-sterigenics-for-their-ethylene-oxide-emissions/

Willowbrook Families File Lawsuit Against Sterigenics for Their Ethylene Oxide Emissions

Published: Sep 21, 2018

Power Rogers & Smith attorneys Todd A. Smith and Brian LaCien are representing Willowbrook families who filed a class action lawsuit against Sterigenics International LLC and GTCR LLC

CHICAGO, Sept. 20, 2018 /PRNewswire/ -- Willowbrook families filed a class action lawsuit against **Sterigenics International LLC** and **GTCR LLC** on September 20 for their decades-old emissions of a highly carcinogenic chemical compound called ethylene oxide.

Sterigenics has been operating a facility in Willowbrook, Illinois since 1984 and uses ethylene oxide to sterilize food/spice products, pharmaceuticals, and medical equipment. The United States Department of Health and Human Services released an August 2018 consultation letter regarding the health impacts from ethylene oxide emissions and concluded that Willowbrook residents and workers alike are at an increased risk of cancer and other health problems, such as neurological effects, respiratory and gastrointestinal effects.

Todd A. Smith and Brian LaCien, attorneys from the law firm of Power Rogers & Smith of Chicago, and Stephen Tillery and John Libra, attorneys from the law firm of Korein Tillery, made the filing today at the Cook County Courthouse in Chicago, Illinois.

"These families and many others in the area now have to go about their daily lives knowing they're living and breathing a harmful, carcinogenic chemical that shouldn't have been used in the first place," Smith said, referencing Sterigenics' ethylene oxide emissions.

The lawsuit filed contains 5 counts, including claims for negligence and strict liability from the severe injuries suffered as a result of ethylene oxide inhalation, claims for nuisance and trespass for the contamination on property, and near their property, and a claim for fraudulent concealment for Sterigenics' decades-long cover up of ethylene oxide's highly carcinogenic nature. The suit contends that for 34 years, Sterigenics has knowingly emitted ethylene oxide into the air, allowing Willowbrook and the surrounding area to be contaminated by a highly carcinogenic chemical.

"This chemical, ethylene oxide, has been a known human carcinogen in the United States and international world since the mid-20th century," said LaCien. "Sterigenics needs to be held responsible for the injuries they've caused and the damage they've done to families and their homes."

View original content:http://www.prnewswire.com/news-releases/willowbrook-families-file-lawsuit-against-sterigenics-for-their-ethylene-oxide-emissions-300716588.html

SOURCE Power Rogers & Smith

Message

Sent: 10/22/2018 3:20:23 PM
To: Witt, Jon [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ea00bc6f645b438682026a77a8d4267c-Witt, Jonat]; Shappley, Ned [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5fc7fde372054ab5ac38f24b9072b73d-Shappley, N]; Caparoso, Jennifer [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=78412d4056534ef288fb8ce390b4bf17-Caparoso, J]
Subject: RE: CONGRESSIONAL: Request: drafting and feedback on response to Sens. Durbin & Duckworth and Rep. Foster regarding ethylene oxide generally and Willowbrook, IL

Hi Ned,

The description of work being done in the chemical sector with proposed schedules looks fine to me.

Also, I would like to declare that I have no conflicts of interest as I have never represented the chemical industry nor have I worked on ethylene oxide related issues in the past.

Best,
Tegan

From: Witt, Jon
Sent: Monday, October 22, 2018 11:01 AM
To: Shappley, Ned <Shappley.Ned@epa.gov>; Lavoie, Tegan <lavoie.tegan@epa.gov>; Caparoso, Jennifer <Caparoso.Jennifer@epa.gov>
Subject: Re: CONGRESSIONAL: Request: drafting and feedback on response to Sens. Durbin & Duckworth and Rep. Foster regarding ethylene oxide generally and Willowbrook, IL

Deliberative Process / Ex. 5

For what it's worth, I've only worked at EPA since graduating college 6 years ago.

Jonathan

From: Shappley, Ned
Sent: Monday, October 22, 2018 10:17:53 AM
To: Lavoie, Tegan; Witt, Jon; Caparoso, Jennifer
Subject: FW: CONGRESSIONAL: Request: drafting and feedback on response to Sens. Durbin & Duckworth and Rep. Foster regarding ethylene oxide generally and Willowbrook, IL

FYI

From: Wayland, Richard
Sent: Friday, 19 October, 2018 10:44
To: Shappley, Ned <Shappley.Ned@epa.gov>

Subject: Fwd: CONGRESSIONAL: Request: drafting and feedback on response to Sens. Durbin & Duckworth and Rep. Foster regarding ethylene oxide generally and Willowbrook, IL

Richard A. "Chet" Wayland
Sent from my iPhone

Begin forwarded message:

> **From:** "Terry, Sara" <Terry.Sara@epa.gov>
> **Date:** October 19, 2018 at 10:38:25 AM EDT
> **To:** "Rimer, Kelly" <Rimer.Kelly@epa.gov>, "Koerber, Mike" <Koerber.Mike@epa.gov>, "Wayland, Richard" <Wayland.Richard@epa.gov>, "Weinstock, Lewis" <Weinstock.Lewis@epa.gov>, "McLamb, Marguerite" <McLamb.Marguerite@epa.gov>, "Sasser, Erika" <Sasser.Erika@epa.gov>
> **Cc:** "Ashley, Jackie" <Ashley.Jackie@epa.gov>
> **Subject: CONGRESSIONAL: Request: drafting and feedback on response to Sens. Durbin & Duckworth and Rep. Foster regarding ethylene oxide generally and Willowbrook, IL**
>
> Hi all,
>
> If you want to send me your comments, I can consolidate them into a unified OAQPS response. I think our main input is in the first few paragraphs. We have specifically been asked to:
>
> 1. Edit/enhanced statement re: continuous monitoring for EtO (so have included Chet and Lew), and
> 2. What we are doing re: facilities, if anything more than the language we have already provided
>
> If you can get me your comments by COB Monday, I will send up Tuesday.
> Sara
>
> ---
>
> **From:** Davis, Matthew
> **Sent:** Thursday, October 18, 2018 5:07 PM
> **To:** Deamer, Eileen <deamer.eileen@epa.gov>; Linkins, Samantha <Linkins.Samantha@epa.gov>; Kaiser, Sven-Erik <Kaiser.Sven-Erik@epa.gov>; Ashley, Jackie <Ashley.Jackie@epa.gov>; Terry, Sara <Terry.Sara@epa.gov>; Rimer, Kelly <Rimer.Kelly@epa.gov>; Koerber, Mike <Koerber.Mike@epa.gov>; Nam, Ed <nam.ed@epa.gov>
> **Cc:** Haman, Patricia <Haman.Patricia@epa.gov>; Moody, Christina <Moody.Christina@epa.gov>; Lubetsky, Jonathan <Lubetsky.Jonathan@epa.gov>; Mroz, Jessica <mroz.jessica@epa.gov>
> **Subject:** Request: drafting and feedback on response to Sens. Durbin & Duckworth and Rep. Foster regarding ethylene oxide generally and Willowbrook, IL
>
> Hello All,
> I hope you had a good Thursday. I'm getting in touch for your help responding to the attached incoming from Sens. Durbin and Duckworth, and Rep. Foster on general/national ethylene oxide and related Willowbrook, IL topics. I've made a first cut at the broad paragraphs that this should include and some specific suggested text for the things I know more about. I have specifically called out the AAship or regional office as much as possible, but I encourage you to look at all and weigh in wherever appropriate. Please take a look and work on edits and drafting text to get back to me by Tuesday 10/23/18 COB (or earlier if possible). I'm going to be running point on this letter, and will hold onto it in CMS, so we'll do our back and forth with text and edits over email, and I'll compile suggestions.
> By mid- next week, once we've got a pretty solid draft, I'll ask you all to review and send up your management chains for approval.

Please let me know if you have any questions.
Thank you in advance for your help on this,
Matthew

Matthew Davis
Office of Congressional Affairs
U.S. Environmental Protection Agency
1200 Pennsylvania Ave, NW, MC-1301A
Washington, DC 20460
(202) 564-1267

Message

From: Shelow, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=3859ABC25E634D418478F3D3CA569C79-SHELOW, DAVID]
Sent: 6/14/2018 1:59:29 PM
To: Dewees, Jason [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=38cc35d204824b6bb3fb95693f7316ea-Dewees, Jason]
Subject: FW: Sterigenics_QAPP_1.0
Attachments: Sterigenics_QAPP_1.0.docx

David M. Shelow
Physical Scientist
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Ambient Air Monitoring Group C304-06
Research Triangle Park, NC 27711
Phone: 919-541-3776
Fax:: 919-541-1903
Email: shelow.david@epa.gov

From: Nwia, Jacqueline
Sent: Monday, May 07, 2018 4:25 PM
To: Shelow, David <Shelow.David@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Subject: Sterigenics_QAPP_1.0

The QAPP for Sterigenics EtO monitoring is attached.

I haven't reviewed it again after making revisions so I'd appreciate any comments/concerns.

Thanks.

Jackie

Jacqueline Nwia
Environmental Scientist
Air Monitoring and Analysis Section
Air Toxics and Assessment Branch
Air and Radiation Division
U.S. Environmental Protection Agency, Region 5
77 West Jackson Blvd. (AR-18)
Chicago, IL 60604
ph. (312) 886-6081
nwia.jacqueline@epa.gov

Message

From: Strum, Madeleine [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=274E5760466644C98978742B76173C3D-STRUM, MADELINE]
Sent: 1/23/2018 7:31:37 PM
To: Smith, Darcie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3ae3c2377efb42879b943db8796ddc05-Smith, Darcie]; Shine, Brenda [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=af5901af23c444f8ae77220210db12e2-BSHINE]; Lavoie, Tegan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eb301a7c4e8f47ef898c1dab1dcf4e3b-Lavoie, Teg]; Witt, Jon [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ea00bc6f645b438682026a77a8d4267c-Witt, Jonat]; Caparoso, Jennifer [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=78412d4056534ef288fb8ce390b4bf17-Caparoso, J]; Palma, Ted [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f7bef4a695c944f089bf3e14f199f8aa-Palma, Ted]
Subject: RE: check in on EtO - files available
Attachments: NATA EO high risk facililities info_mls.docx

Here is the file.

From: Strum, Madeleine
Sent: Tuesday, January 23, 2018 9:11 AM
To: Smith, Darcie <Smith.Darcie@epa.gov>; Shine, Brenda <Shine.Brenda@epa.gov>; Lavoie, Tegan <lavoie.tegan@epa.gov>; Witt, Jon <Witt.Jon@epa.gov>; Caparoso, Jennifer <Caparoso.Jennifer@epa.gov>; Palma, Ted <Palma.Ted@epa.gov>
Subject: RE: check in on EtO - files available

Deliberative Process / Ex. 5
Deliberative Process / Ex. 5 I can send the file later today.

Madeleine Strum|U.S. Environmental Protection Agency|109 TW Alexander Drive, RTP, NC 27711
Office of Air Quality Planning and Standards|Air Quality Assessment Division|Emission Inventory and Analysis Group|919 541 2383

From: Smith, Darcie
Sent: Monday, January 22, 2018 10:47 AM
To: Shine, Brenda <Shine.Brenda@epa.gov>; Lavoie, Tegan <lavoie.tegan@epa.gov>; Witt, Jon <Witt.Jon@epa.gov>; Strum, Madeleine <Strum.Madeleine@epa.gov>; Caparoso, Jennifer <Caparoso.Jennifer@epa.gov>; Palma, Ted <Palma.Ted@epa.gov>
Subject: check in on EtO - files available

Hi –

Hope everyone had some fun in the snow ☺

As you know, for NATA, we are currently working on version 2 and we started by modeling the ethylene oxide-emitting point sources first. So we now have risk results for those facilities. I've uploaded two Excel files to my OneDrive and shared them with you. The v1 files are all still there and available for you as well. (I have a SharePoint site that we'll switch to eventually, but at the moment it won't let me make new pages.)

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5 If you have other agenda items, please let me know.

Thanks,
Darcie

Deliberative Process / Ex. 5

Darcie Smith
U.S. EPA/OAQPS/ATAG
(919) 541-2076

Message

From: Rowan, Anne [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=02CBCC49DDB94091B9F4E358EB001352-AROWAN]
Sent: 9/27/2018 9:28:58 PM
To: Kelley, Jeff [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e154fa5a5f744c70aa3da58e3f87aabe-JKelley]; Arcaute, Francisco [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2a7ae3e04ae141b591f3bb052eeeb52f-FArcaute]; Bassler, Rachel [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=6dfb9f45b1e3443e95fe97296e7a8467-Bassler, Rachel]; Lippert, Allison [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=6255cc36a54f4ffdbf0d8ebc24bf5f45-ANowotar]; Singer, Joshua [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f29c3a13f65447ae887edd3bdc89d77a-JSinge02]
Subject: Yesterday's press wrap up

News Tribune (Jeff Dankert) [Received 9/26] - OPEN – Reporter has questions about the residential removal cleanup at the Matthiessen & Hegeler Zinc Superfund site. DDL not specified.

Indiana Public Broadcasting (Rebecca Thiele) [Received 9/26] - OPEN – Reporter has questions about technical assistance grants across the country. DDL noon.

CBS-58 Milwaukee (Whitney Martin) [Received 9/26] - CLOSED – reporter has questions about case of Legionnaires disease in Milwaukee County. Referred to health dept.

Detroit Public TV (Gary Wilson) [Received 9/26] - OPEN – reporter requests amount of GLRI funding awarded to combat algae blooms in western Lake Erie. DDL 9/27

WBEZ (Kristen Schorsch) [Received 9/26] – OPEN – Reporter wants a comment about a Cook County board resolution that calls for Illinois Gov. Bruce Rauner and the U.S. EPA to declare Sterigenics in suburban Chicago a threat to public health and also an Illinois EPA letter asking U.S. EPA to perform ambient air monitoring. DDL today.

ABC 7 Chicago (Mark Rivera) [Received 9/26] - OPEN - Reporter wants to know if there is an investigation into Sterigenics in Willowbrook and if any action has been taken against the company or is planned. DDL not specified.
Chicago Tribune (Michael Hawthorne) [Received 9/26] - CLOSED - Reporter wants information about Sterigenics stack test last week. DDL not specified.

Anne Rowan, Chief
News Media & Intergovernmental Relations Section
Office of External Communications
U.S. EPA Region 5, Chicago
rowan.anne@epa.gov
312-353-9391

740
1990

IN THE CIRCUIT COURT OF THE EIGHTEENTH JUDICIAL CIRCUIT
DUPAGE COUNTY, ILLINOIS
CHANCERY DIVISION

FILED
2015 SEP 18 AM 9:21

PEOPLE OF THE STATE OF ILLINOIS, *ex rel.* LISA MADIGAN, Attorney General of the State of Illinois,	)	
Plaintiff,	)	
v.	)	No. 2015 CH 651
STERIGENICS U.S., LLC, a Delaware limited liability company,	)	
Defendant.	)	

CASE CLOSED
JUDGE'S INIT.

CONSENT ORDER

Plaintiff, PEOPLE OF THE STATE OF ILLINOIS, *ex rel.* LISA MADIGAN, Attorney General of the State of Illinois, the Illinois Environmental Protection Agency ("Illinois EPA"), and Defendant, STERIGENICS U.S., LLC, (collectively, "Parties to the Consent Order") have agreed to the making of this Consent Order and submit it to this Court for approval.

I. INTRODUCTION

This stipulation of facts is made and agreed upon for purposes of settlement only and as a factual basis for the Court's entry of the Consent Order and issuance of any injunctive relief. None of the facts stipulated herein shall be introduced into evidence in any other proceeding regarding the violations of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/1 *et seq.* (2014), and the Illinois Pollution Control Board ("Board") Regulations, alleged in the Complaint except as otherwise provided herein. It is the intent of the parties to this Consent Order that it be a final judgment on the merits of this matter.

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A. Parties

1. On April 3, 2015, a Complaint was filed on behalf of the People of the State of Illinois by Lisa Madigan, Attorney General of the State of Illinois, on her own motion and upon the request of the Illinois EPA, pursuant to Section 42(d) and (e) of the Act, 415 ILCS 5/42(d) and (e) (2014), against the Defendant.

2. The Illinois EPA is an administrative agency of the State of Illinois, created pursuant to Section 4 of the Act, 415 ILCS 5/4 (2014).

3. At all times relevant to the Complaint, Defendant Sterigenics U.S., LLC was, and is, a Delaware limited liability company, and operated a gaseous sterilization business located at 7775 Quincy Street, Willowbrook, DuPage County, Illinois ("Facility" or "Site").

4. The Defendant's sterilization process uses ethylene oxide, a hazardous air pollutant, and generates ethylene glycol and other chemicals.

5. Plaintiff has alleged that, on or about October 7, 2013, the Defendant released ethylene glycol into soil and groundwater at, and in the vicinity of, the Site.

6. On October 21, 2013, the Defendant reported the uncontrolled release of 30 pounds of ethylene oxide gas to the atmosphere. The Defendant subsequently revised its estimate of the quantity of ethylene oxide released to approximately 12 pounds.

B. Allegations of Non-Compliance

Plaintiff contends that the Defendant has violated the following provisions of the Act and Board Regulations:

Count I: WATER POLLUTION, violation of 415 ILCS 5/12(a) (2014);

Count II: CREATING A WATER POLLUTION HAZARD, violation of 415

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ILCS 5/12(d) (2014);

Count III: VIOLATION OF GENERAL USE WATER QUALITY STANDARDS, 415 ILCS 5/9(a) (2014), and 35 Ill. Adm. Code 302.203;

Count IV: NPDES PERMIT VIOLATION, 415 ILCS 5/12(f) (2014), and 35 Ill. Adm. Code 309.102;

Count V: AIR POLLUTION, violation of 415 ILCS 5/9(a) (2014) and 35 Ill. Adm. Code 201.141;

Count VI: VIOLATION OF CAAPP PERMIT CONDITIONS: FAILURE TO COMPLY WITH NESHAP EMISSION STANDARDS, 415 ILCS 5/9.1(d) (2014), 415 ILCS 5/39.5(6) (2014), 40 CFR 63.362(a), and Conditions 7.1.6(c)(1) and 7.1.3(b)(ii) of CAAPP Permit No. 95120085;

Count VII: VIOLATION OF CAAPP PERMIT CONDITIONS: FAILURE TO COMPLY WITH EMISSION LIMITATIONS FOR THE CHICAGO AREA, 415 ILCS 5/9(a) (2014), 415 ILCS 5/39.5(6) (2014), 35 Ill. Adm. Code 218.986(a), and Condition 7.1.3(d)(i) of CAAPP Permit No. 95120085.

C. Non-Admission of Violations

The Defendant represents that it has entered into this Consent Order for the purpose of settling and compromising disputed claims without having to incur the expense of contested litigation. By entering into this Consent Order and complying with its terms, the Defendant does not affirmatively admit the allegations of violation within the Complaint and referenced above, and this Consent Order shall not be interpreted as including such admission.

D. Compliance Activities to Date

1. On January 13, 2014, the Defendant applied to enter its Facility into Illinois EPA's voluntary Site Remediation Program ("SRP") to address remediation of the release of ethylene glycol, propylene glycol and sulfate from the Facility. The Facility remediation project

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was designated under the SRP as the "Sterigenics US LLC site, LPC No. 0431105032" ("On Site SRP").

2. On November 18, 2014, Illinois EPA issued a No Further Remediation letter ("NFR letter") to the Defendant for the work performed under the On-Site SRP. The Defendant recorded the NFR letter for the On-Site SRP with the office of the DuPage County Recorder on December 5, 2014.

3. On July 13, 2014, the Defendant applied to enter off-site areas which were affected, or potentially affected, by the release of ethylene glycol, propylene glycol, and sulfate into the SRP. The off-site remediation project has been designated by Illinois EPA as the "Willowbrook Centre Joint Venture, LPC No. 0431105077" ("Off-Site SRP").

4. On May 29, 2015, Illinois EPA issued an NFR letter to the Defendant for work performed under the Off-Site SRP. The Defendant recorded the NFR letter for the Off-Site SRP with the office of the DuPage County Recorder on July 6, 2015.

II. APPLICABILITY

This Consent Order shall apply to and be binding upon the Parties to the Consent Order. The Defendant waives as a defense to any enforcement action taken pursuant to this Consent Order the failure of any of its officers, directors, agents, employees or successors or assigns to take such action as shall be required to comply with the provisions of this Consent Order. This Consent Order may be used against the Defendant in any subsequent enforcement action or permit proceeding as proof of a past adjudication of violation of the Act and the Board Regulations for all violations alleged in the Complaint in this matter, for purposes of Sections 39 and 42 of the Act, 415 ILCS 5/39 and 42 (2014).

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III. JUDGMENT ORDER

This Court has jurisdiction of the subject matter herein and of the Parties to the Consent Order and, having considered the stipulated facts and being advised in the premises, finds the following relief appropriate:

IT IS HEREBY ORDERED, ADJUDGED AND DECREED:

A. Civil Penalty

1. The Defendant shall pay a civil penalty of Fifty Thousand Dollars ($50,000.00). Payment shall be tendered at time of entry of the Consent Order.

2. The civil penalty payment shall be made by certified check or money order payable to the Illinois EPA for deposit into the Environmental Protection Trust Fund ("EPTF").

3. The case name and case number shall appear on the face of the certified check or money order.

B. Future Compliance

1. The Defendant shall comply with the terms and conditions of its Clean Air Act Permit Program ("CAAPP) Permit.

2. This Consent Order in no way affects the responsibilities of the Defendant to comply with any other federal, state or local laws or regulations, including but not limited to the Act and the Board Regulations.

3. The Defendant shall cease and desist from future violations of the Act and Board Regulations that were the subject matter of the Complaint.

C. Enforcement and Modification of Consent Order

1. This Consent Order is a binding and enforceable order of this Court. This Court shall retain jurisdiction of this matter and shall consider any motion by any party for the purposes

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of interpreting and enforcing the terms and conditions of this Consent Order. The Defendant agrees that notice of any subsequent proceeding to enforce this Consent Order may be made by mail and waives any requirement of service of process.

2. The Parties to the Consent Order may, by mutual written consent, extend any compliance dates or modify the terms of this Consent Order without leave of this Court. A request for any modification shall be made in writing and submitted to the designated representatives. Any such request shall be made by separate document, and shall not be submitted within any other report or submittal required by this Consent Order. Any such agreed modification shall be in writing and signed by authorized representatives of each party, for filing and incorporation by reference into this Consent Order.

D. Release from Liability

In consideration of the Defendant's payment of a $50,000.00 civil penalty and its commitment to cease and desist as contained in Section III.B.2 above, the Plaintiff releases, waives and discharges the Defendant from any further liability or penalties for the violations of the Act and Board Regulations that were the subject matter of the Complaint herein. The release set forth above does not extend to any matters other than those expressly specified in Plaintiff's Complaint filed on April 3, 2015. The Plaintiff reserves, and this Consent Order is without prejudice to, all rights of the State of Illinois against the Defendant with respect to all other matters, including but not limited to the following:

a. criminal liability;

b. liability for future violations;

c. liability for natural resources damage arising out of the alleged violations; and

d. the Defendant's failure to satisfy the requirements of this Consent Order.

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Nothing in this Consent Order is intended as a waiver, discharge, release, or covenant not to sue for any claim or cause of action, administrative or judicial, civil or criminal, past or future, in law or in equity, which the State of Illinois may have against any person, as defined by Section 3.315 of the Act, 415 ILCS 5/3.315 (2014), other than the Defendant.

E. Execution and Entry of Consent Order

This Order shall become effective only when executed by all Parties to the Consent Order and the Court. This Order may be executed by the parties in one or more counterparts, all of which taken together shall constitute one and the same instrument. The undersigned representatives for each party certify that they are fully authorized by the party whom they represent to enter into the terms and conditions of this Consent Order and to legally bind them to it.

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WHEREFORE, the parties, by their representatives, enter into this Consent Order and submit it to this Court that it may be approved and entered.

AGREED:

FOR THE PLAINTIFF:

PEOPLE OF THE STATE OF ILLINOIS
ex rel. LISA MADIGAN
Attorney General of the
State of Illinois

MATTHEW J. DUNN, Chief
Environmental Enforcement/
Asbestos Litigation Division

BY: Elizabeth Wallace
ELIZABETH WALLACE, Chief
Assistant Attorney General
Environmental Bureau

DATE: 9/14/15

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

LISA BONNETT, Director
Illinois Environmental Protection Agency

BY: _____
JOHN J. KIM
Chief Legal Counsel

DATE: 9/10/15

ED_002192A_00028591-00008

FOR THE DEFENDANT:

STERIGENICS U.S., LLC

BY: KAHoOman

Its: SVP - Global EH&S

DATE: 08-Sept-2015

ENTERED:

JUDGE

DATE: 9-18-15

People v. Sterigenics U.S. LLC, 15 CH 651

ED_002192A_00028591-00009

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-2829
PAT QUINN, GOVERNOR LISA BONNETT, DIRECTOR

VN 08

TDD 217/782-9143

NOV 12 2013

Certified Mail # 7009 3410 0002 3750 1640
Return Receipt Requested

Kevin Wagner
Sterigenics US LLC
7775 Quincy Street
Willowbrook, Illinois 60527

RE: Violation Notice M-2013-03005
I.D. 043110AAC

Dear Mr. Wagner:

This constitutes a Violation Notice pursuant to Section 31(a)(1) of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/31(a)(1), and is based upon a review of available information and an investigation by representatives of the Illinois Environmental Protection Agency ("Illinois EPA").

The Illinois EPA hereby provides notice of alleged violations of environmental laws, regulations, or permits as set forth in Attachments A and B to this letter. Attachments A and B include an explanation of the activities that the Illinois EPA believes may resolve the specified alleged violations, including an estimate of a reasonable time period to complete the necessary activities. Due to the nature and seriousness of the alleged violations, please be advised that resolution of the violations may also require the involvement of a prosecutorial authority for purposes that may include, among others, the imposition of statutory penalties.

A written response, which may include a request for a meeting with representatives of the Illinois EPA, must be submitted via certified mail to the Illinois EPA within 45 days of receipt of this letter. If a meeting is requested, it shall be held within 60 days of receipt of this notice. The response must include information in rebuttal, explanation, or justification of each alleged violation and a statement indicating whether or not the source wishes to enter into a Compliance Commitment Agreement ("CCA") pursuant to Section 31(a) of the Act. If the source wishes to enter into a CCA, the written response must also include proposed terms for the CCA that contains dates for achieving each commitment and may also include a statement that compliance has been achieved for some or all of the alleged violations. In order to increase the likelihood of the Illinois EPA accepting such terms, the written response should specifically propose them in a manner that can be formalized into an enforceable agreement between the Illinois EPA and the source. As such, proposed conditions should be as detailed as possible, including steps to be taken to achieve compliance, the manner of compliance, interim and completion dates, etc.

DIVISION OF RECORDS MANAGEMENT
RELEASABLE
FEB 05 2014
REVIEWER: MJK

4302 N. Main St., Rockford, IL 61103 (815) 987-7760
595 S. State, Elgin, IL 60123 (847) 608-3131
2125 S. First St., Champaign, IL 61820 (217) 278-5800
2009 Mall St., Collinsville, IL 62234 (618) 346-5120

9511 Harrison St., Des Plaines, IL 60016 (847) 294-4000
5407 N. University St., Arbor 113, Peoria, IL 61614 (309) 693-5462
2309 W. Main St., Suite 116, Marion, IL 62959 (618) 993-7200
100 W. Randolph, Suite 10-300, Chicago, IL 60601 (312) 814-6026

PLEASE PRINT ON RECYCLED PAPER

The Illinois EPA will review the proposed terms for a CCA provided by the source and, within 30 days of receipt, will respond with either a proposed CCA or a notice that no CCA will be issued by the Illinois EPA. If the Illinois EPA sends a proposed CCA, the source must respond in writing by either agreeing to and signing the proposed CCA or by notifying the Illinois EPA that the source rejects the terms of the proposed CCA.

If a timely written response to this Violation Notice is not provided, it shall be considered a waiver of the opportunity to respond and meet, and the Illinois EPA may proceed with referral to the prosecutorial authority.

Written communications should be directed to JOHN REKESIUS, Illinois EPA, Bureau of Air, Compliance Unit, P.O. Box 19276, Springfield, Illinois 62794-9276. All communications must include reference to the Violation Notice number in this matter.

Questions regarding the violations identified in Attachment A should be directed to ROMAN DABROS or GEORGE ORDIJA at 847/294-4000.

Questions regarding the violations identified in Attachment B should be directed to Cathy Siders at (217) 524-6308.

Sincerely,

Raymond E. Pilapil, Manager
Compliance Section
Bureau of Air

REP:jr

ATTACHMENT A

Per observations by Roman Dabros and George Ordija on October 23, 2013, and other available information:

VIOLATIONS:

1. Section 9(a) of the Act and 35 Ill. Adm. Code 201.141: Sterigenics US LLC caused, threatened, or allowed the discharge of ethylene oxide into the atmosphere from Sterilization Chamber B, so as to cause or tend to cause air pollution.

2. Section 39.5(6)(a) of the Act and condition 7.1.3(d) of Clean Air Act Permit Program ("CAAPP") permit 95120085: Sterigenics US LLC failed to remove Sterilization Chamber B from sterilization service or taking other action so that excess emissions cease.

3. Sections 9(a), 9.1(d), and 39.5(6)(a) of the Act, 40 CFR 63.362(c), and conditions 7.1.3(b) and 7.1.6(c)(i) of CAAPP permit 95120085: Sterigenics US LLC failed to reduce ethylene oxide emissions from Sterilization Chamber B by at least 99 percent during the October 20, 2013, event.

4. Sections 9(a) and 39.5(6)(a) of the Act, 35 Ill. Adm. Code 218.986(a), and condition 7.1.3(d)(i) of CAAPP permit 95120085: Sterigenics US LLC failed to achieve an overall reduction in uncontrolled VOM emissions from Sterilization Chamber B of at least 81 percent during October 20, 2013, event.

RECOMMENDATIONS:

The Illinois EPA suggests that Sterigenics US LLC take the following action to address the violations stated above:

> Within 45 days of receipt of this Violation Notice, develop, implement, and submit to the Illinois EPA, Bureau of Air, Compliance Section, internal procedures which ensure that ethylene oxide emissions from the sterilization units will comply with the requirements of 40 CFR 63.362(c), 35 Ill. Admin. Code 218.986(a), and not cause or tend to cause air pollution.

Attachment B

On October 16, 2013, an ethylene glycol solution was discharging into stormwater ponds located near 600 Joliet Rd. in Willowbrook (DuPage County). The discharge was traced back to a stormwater roof drainage line at Sterigenics located at 7775 S. Quincy St. in Willowbrook. During the inspection it was noted that ethylene glycol, process wastewater was seeping into the roof drainage line from contaminated groundwater.

Unpermitted Discharge
Implement necessary actions to prevent any further discharges. Apply for and obtain an NPDES Permit from the Illinois EPA for the discharge or submit appropriate documentation that the discharge has been permanently eliminated and a permit is no longer required. Compliance is expected immediately.

Violation Date	Violation Description
10/16/2013 – present	Except as in compliance with the provisions of the Act, Board regulations, and the CWA (Clean Water Act), and the provisions and conditions of the NPDES (National Pollutant Discharge Elimination System) permit issued to the discharger, the discharge of any contaminant or pollutant by any person into the waters of the State from a point source shall be unlawful.
Rule/Reg:	Section 12(a), (d), and (f) of the Act, 415 ILCS5/12(a), (d), and (f) (2012), 35 Ill. Adm. Code 302.203, and 309.102(a)

Attention:

Sterigenics US LLC
Attn: Kevin Wagner
2015 Spring Road, Suite 650
Oak Brook, Illinois 60521

State of Illinois

CLEAN AIR ACT PERMIT PROGRAM (CAAPP) PERMIT

Source:

Sterigenics US LLC
7775 Quincy Street
Willowbrook, Illinois 60521

I.D. No.: 043110AAC
Permit No.: 95120085

Permitting Authority:

Illinois Environmental Protection Agency
Bureau of Air, Permit Section
217/785-1705

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-2829
BRUCE RAUNER, GOVERNOR LISA BONNETT, DIRECTOR

CLEAN AIR ACT PERMIT PROGRAM (CAAPP) PERMIT

Type of Application:	Renewal
Purpose of Application:	Renew Existing CAAPP Permit for 5 Years
ID No.:	043110AAC
Permit No.:	95120085
Statement of Basis No.:	95120085-0415
Date Application Received:	March 25, 2011
Date Issued:	June 8, 2015
Expiration Date:	June 8, 2020
Renewal Submittal Date:	9 Months Prior to June 8, 2020
Source Name:	Sterigenics US, LLC
Address:	7775 Quincy Street
City:	Willowbrook
County:	DuPage
ZIP Code:	60521

This permit is hereby granted to the above-designated source authorizing operation in accordance with this CAAPP permit, pursuant to the above referenced application. This source is subject to the conditions contained herein. For further information on the source see Section 1 and for further discussion on the effectiveness of this permit see Condition 2.3(g).

If you have any questions concerning this permit, please contact Brandon Nolen at 217/785-1705.

Raymond E. Pilapil
Acting Manager, Permit Section
Division of Air Pollution Control

REP:MTR:BMN:psj

cc: IEPA, Permit Section
IEPA, FOS, Region 1
Lotus Notes Database

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Section 1 - Source Information

1. Addresses

Source

Sterigenics US LLC
7775 Quincy Street
Willowbrook, Illinois 60521

Owner

Sterigenics US LLC
2015 Spring Road, Suite 450
Oak Brook, Illinois 60523

Operator

Sterigenics US1 LLC
7775 Quincy Street
Willowbrook, Illinois 60521

Permittee

The Owner or Operator of the source as identified in this table.

2. Contacts

Certified Officials

The source shall submit an Administrative Permit Amendment for any change in the Certified Officials, pursuant to Section 39.5(13) of the Act.

	Name	*Title*
Responsible Official	Kathleen Hoffman	Vice President
Delegated Authority	No other individuals have been authorized by the IEPA.	N/A

Other Contacts

	Name	*Phone No.*	*Email*
Source Contact	Kevin Wagner	630-928-1771	kwagner@sterigenics.com
Technical Contact	Kevin Wagner	630-928-1771	kwagner@sterigenics.com
Correspondence	Kevin Wagner	630-928-1771	kwagner@sterigenics.com
Billing	Kevin Wagner	630-928-1771	kwagner@sterigenics.com

3. Single Source

The source identified in Condition 1.1 above shall be defined to include all the following additional source(s):

I.D. No.	*Permit No.*	*Single Source Name and Address*
N/A	N/A	N/A

Section 2 - General Permit Requirements

1. Prohibitions

a. It shall be unlawful for any person to violate any terms or conditions of this permit issued under Section 39.5 of the Act, to operate the CAAPP source except in compliance with this permit issued by the IEPA under Section 39.5 of the Act or to violate any other applicable requirements. All terms and conditions of this permit issued under Section 39.5 of the Act are enforceable by USEPA and citizens under the Clean Air Act, except those, if any, that are specifically designated as not being federally enforceable in this permit pursuant to Section 39.5(7)(m) of the Act. [Section 39.5(6)(a) of the Act]

b. After the applicable CAAPP permit or renewal application submittal date, as specified in Section 39.5(5) of the Act, the source shall not operate this CAAPP source without a CAAPP permit unless the complete CAAPP permit or renewal application for such source has been timely submitted to the IEPA. [Section 39.5(6)(b) of the Act]

c. No Owner or Operator of the CAAPP source shall cause or threaten or allow the continued operation of an emission source during malfunction or breakdown of the emission source or related air pollution control equipment if such operation would cause a violation of the standards or limitations applicable to the source, unless this CAAPP permit granted to the source provides for such operation consistent with the Act and applicable Illinois Pollution Control Board regulations. [Section 39.5(6)(c) of the Act]

d. Pursuant to Section 39.5(7)(g) of the Act, emissions from the source are not allowed to exceed any allowances that the source lawfully holds under Title IV of the Clean Air Act or the regulations promulgated thereunder, consistent with Section 39.5(17) of the Act and applicable requirements, if any.

2. Emergency Provisions

Pursuant to Section 39.5(7)(k) of the Act, the Owner or Operator of the CAAPP source may provide an affirmative defense of emergency to an action brought for noncompliance with technology-based emission limitations under this CAAPP permit if the following conditions are met through properly signed, contemporaneous operating logs, or other relevant evidence:

a. i. An emergency occurred and the source can identify the cause(s) of the emergency.

ii. The source was at the time being properly operated.

iii. The source submitted notice of the emergency to the IEPA within 2 working days of the time when emission limitations were exceeded due to the emergency. This notice must contain a detailed description of the emergency, any steps taken to mitigate emissions, and corrective actions taken.

iv. During the period of the emergency the source took all reasonable steps to minimize levels of emissions that exceeded the emission limitations, standards, or requirements in this permit.

b. For purposes of Section 39.5(7)(k) of the Act, "emergency" means any situation arising from sudden and reasonably unforeseeable events beyond the control of the source, such as an act of God, that requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under this permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventive maintenance, careless or improper operation, or operation error.

c. In any enforcement proceeding, the source seeking to establish the occurrence of an emergency has the burden of proof. This provision is in addition to any emergency or

upset provision contained in any applicable requirement. This provision does not relieve the source of any reporting obligations under existing federal or state laws or regulations.

3. General Provisions

a. Duty to Comply

The source must comply with all terms and conditions of this permit. Any permit noncompliance constitutes a violation of the CAA and the Act, and is grounds for any or all of the following: enforcement action; permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. [Section 39.5(7)(o)(i) of the Act]

b. Need to Halt or Reduce Activity is not a Defense

It shall not be a defense for the source in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. [Section 39.5(7)(o)(ii) of the Act]

c. Duty to Maintain Equipment

The source shall maintain all equipment covered under this permit in such a manner that the performance or operation of such equipment shall not cause a violation of applicable requirements. [Section 39.5(7)(a) of the Act]

d. Disposal Operations

The source shall be operated in such a manner that the disposal of air contaminants collected by the equipment operations, or activities shall not cause a violation of the Act or regulations promulgated there under. [Section 39.5(7)(a) of the Act]

e. Duty to Pay Fees

i. The source must pay fees to the IEPA consistent with the fee schedule approved pursuant to Section 39.5(18) of the Act, and submit any information relevant thereto. [Section 39.5(7)(o)(vi) of the Act]

ii. The IEPA shall assess annual fees based on the allowable emissions of all regulated air pollutants, except for those regulated air pollutants excluded in Section 39.5(18)(f) of the Act and insignificant activities in Section 6, at the source during the term of this permit. The amount of such fee shall be based on the information supplied by the applicant in its complete CAAPP permit application. [Section 39.5(18)(a)(ii)(A) of the Act]

iii. The check should be payable to "Treasurer, State of Illinois" and sent to: Fiscal Services Section, Illinois EPA, P.O. Box 19276, Springfield, IL, 62794-9276. Include on the check: ID #, Permit #, and "CAAPP Operating Permit Fees". [Section 39.5(18)(e) of the Act]

f. Obligation to Allow IEPA Surveillance

Pursuant to Sections 4(a), 39.5(7)(a), and 39.5(7)(p)(ii) of the Act, inspection and entry requirements that necessitate that, upon presentation of credentials and other documents as may be required by law and in accordance with constitutional limitations, the source shall allow the IEPA, or an authorized representative to perform the following:

i. Enter upon the source's premises where the emission unit(s) are located or emissions-related activity is conducted, or where records must be kept under the conditions of this permit.

ii. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit.

iii. Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit.

iv. Sample or monitor any substances or parameters at any location at reasonable times:

A. As authorized by the Clean Air Act or the Act, at reasonable times, for the purposes of assuring compliance with this CAAPP permit or applicable requirements; or

B. As otherwise authorized by the Act.

v. Enter and utilize any photographic, recording, testing, monitoring, or other equipment for the purposes of preserving, testing, monitoring, or recording any activity, discharge or emission at the source authorized by this permit.

g. **Effect of Permit**

i. Pursuant to Section 39.5(7)(j)(iv) of the Act, nothing in this CAAPP permit shall alter or affect the following:

A. The provisions of Section 303 (emergency powers) of the CAA, including USEPA's authority under that Section.

B. The liability of the Owner or Operator of the source for any violation of applicable requirements prior to or at the time of permit issuance.

C. The applicable requirements of the acid rain program consistent with Section 408(a) of the Clean Air Act.

D. The ability of USEPA to obtain information from the source pursuant to Section 114 (inspections, monitoring, and entry) of the Clean Air Act.

ii. Notwithstanding the conditions of this permit specifying compliance practices for applicable requirements, pursuant to Sections 39.5(7)(j) and (p) of the Act, any person (including the Permittee) may also use other credible evidence to establish compliance or noncompliance with applicable requirements. [35 IAC 201.122 and Section 39.5(7)(a) of the Act]

h. **Severability Clause**

The provisions of this permit are severable. In the event of a challenge to any portion of this permit, other portions of this permit may continue to be in effect. Should any portion of this permit be determined to be illegal or unenforceable, the validity of the other provisions shall not be affected and the rights and obligations of the source shall be construed and enforced as if this permit did not contain the particular provisions held to be invalid and the applicable requirements underlying these provisions shall remain in force. [Section 39.5(7)(i) of the Act]

4. Testing

a. Tests conducted to measure composition of materials, efficiency of pollution control devices, emissions from process or control equipment, or other parameters shall be conducted using standard test methods if applicable test methods are not specified by the applicable regulations or otherwise identified in the conditions of this permit. Documentation of the test date, conditions, methodologies, calculations, and test results shall be retained pursuant to the recordkeeping procedures of this permit. Reports of

any tests conducted as required by this permit or as the result of a request by the IEPA shall be submitted as specified in Condition 7.1 of this permit. [35 IAC Part 201 Subpart J and Section 39.5(7)(a) of the Act]

b. Pursuant to Section 4(b) of the Act and 35 IAC 201.282, every emission source or air pollution control equipment shall be subject to the following testing requirements for the purpose of determining the nature and quantities of specified air contaminant emissions and for the purpose of determining ground level and ambient air concentrations of such air contaminants:

i. Testing by Owner or Operator: The IEPA may require the Owner or Operator of the emission source or air pollution control equipment to conduct such tests in accordance with procedures adopted by the IEPA, at such reasonable times as may be specified by the IEPA and at the expense of the Owner or Operator of the emission source or air pollution control equipment. All such tests shall be made by or under the direction of a person qualified by training and/or experience in the field of air pollution testing. The IEPA shall have the right to observe all aspects of such tests.

ii. Testing by the IEPA: The IEPA shall have the right to conduct such tests at any time at its own expense. Upon request of the IEPA, the Owner or Operator of the emission source or air pollution control equipment shall provide, without charge to the IEPA, necessary holes in stacks or ducts and other safe and proper testing facilities, including scaffolding, but excluding instruments and sensing devices, as may be necessary.

5. Recordkeeping

a. **Control Equipment Maintenance Records**

Pursuant to Section 39.5(7)(b) of the Act, a maintenance record shall be kept on the premises for each item of air pollution control equipment. At a minimum, this record shall show the dates maintenance was performed and the nature of preventative maintenance activities.

b. **Retention of Records**

i. Records of all monitoring data and support information shall be retained for a period of at least 5 years from the date of the monitoring sample, measurement, report, or application. Support information includes all calibration and maintenance records, original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit. [Section 39.5(7)(e)(ii) of the Act]

ii. Pursuant to Section 39.5(7)(a) of the Act, other records required by this permit including any logs, plans, procedures, or instructions required to be kept by this permit shall be retained for a period of at least 5 years from the date of entry unless a different period is specified by a particular permit provision.

c. **Availability of Records**

i. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall retrieve and provide paper copies, or as electronic media, any records retained in an electronic format (e.g., computer) in response to an IEPA or USEPA request during the course of a source inspection.

ii. Pursuant to Section 39.5(7)(a) of the Act, upon written request by the IEPA for copies of records or reports required to be kept by this permit, the Permittee shall promptly submit a copy of such material to the IEPA. For this purpose, material shall be submitted to the IEPA within 30 days unless additional time is provided by the IEPA or the Permittee believes that the volume and nature of

requested material would make this overly burdensome, in which case, the Permittee shall respond within 30 days with the explanation and a schedule for submittal of the requested material. (See also Condition 2.9(d))

6. Certification

a. **Compliance Certification**

i. Pursuant to Section 39.5(7)(p)(v)(C) of the Act, the source shall submit annual compliance certifications by May 1 unless a different date is specified by an applicable requirement or by a particular permit condition. The annual compliance certifications shall include the following:

A. The identification of each term or condition of this permit that is the basis of the certification.

B. The compliance status.

C. Whether compliance was continuous or intermittent.

D. The method(s) used for determining the compliance status of the source, both currently and over the reporting period consistent with the conditions of this permit.

ii. Pursuant to Section 39.5(7)(p)(v)(D) of the Act, all compliance certifications shall be submitted to the IEPA Compliance Section. Address is included in Attachment 3.

iii. Pursuant to Section 39.5(7)(p)(i) of the Act, all compliance reports required to be submitted shall include a certification in accordance with Condition 2.6(b).

b. **Certification by a Responsible Official**

Any document (including reports) required to be submitted by this permit shall contain a certification by the responsible official of the source that meets the requirements of Section 39.5(5) of the Act and applicable regulations. [Section 39.5(7)(p)(i) of the Act]. An example Certification by a Responsible Official is included in Attachment 4 of this permit.

7. Permit Shield

a. Pursuant to Section 39.5(7)(j) of the Act, except as provided in Condition 2.7(b) below, the source has requested and has been granted a permit shield. This permit shield provides that compliance with the conditions of this permit shall be deemed compliance with applicable requirements which were applicable as of the date the proposed permit for this source was issued, provided that either the applicable requirements are specifically identified within this permit, or the IEPA, in acting on this permit application, has determined that other requirements specifically identified are not applicable to this source and this determination (or a concise summary thereof) is included in this permit. This permit shield does not extend to applicable requirements which are promulgated after April 22, 2015 (date USEPA notice started), unless this permit has been modified to reflect such new requirements.

b. Pursuant to Section 39.5(7)(j) of the Act, this permit and the terms and conditions herein do not affect the Permittee's past and/or continuing obligation with respect to statutory or regulatory requirements governing major source construction or modification under Title I of the CAA. Further, neither the issuance of this permit nor any of the terms or conditions of the permit shall alter or affect the liability of the Permittee for any violation of applicable requirements prior to or at the time of permit issuance.

c. Pursuant to Section 39.5(7)(a) of the Act, the issuance of this permit by the IEPA does not and shall not be construed as barring, diminishing, adjudicating or in any way affecting any currently pending or future legal, administrative or equitable rights or claims, actions, suits, causes of action or demands whatsoever that the IEPA or the USEPA may have against the applicant including, but not limited to, any enforcement action authorized pursuant to the provision of applicable federal and state law.

8. Title I Conditions

Pursuant to Sections 39(a), 39(f), and 39.5(7)(a) of the Act, as generally identified below, this CAAPP permit may contain certain conditions that relate to requirements arising from the construction or modification of emission units at this source. These requirements derive from permitting programs authorized under Title I of the Clean Air Act (CAA) and regulations thereunder, and Title X of the Illinois Environmental Protection Act (Act) and regulations implementing the same. Such requirements, including the New Source Review programs for both major (i.e., PSD and nonattainment areas) and minor sources, are implemented by the IEPA.

a. This permit may contain conditions that reflect requirements originally established in construction permits previously issued for this source. These conditions include requirements from preconstruction permits issued pursuant to regulations approved or promulgated by USEPA under Title I of the CAA, as well as requirements contained within construction permits issued pursuant to state law authority under Title X of the Act. Accordingly, all such conditions are incorporated into this CAAPP permit by virtue of being either an "applicable Clean Air Act requirement" or an "applicable requirement" in accordance with Section 39.5 of the Act. These conditions are identifiable herein by a designation to their origin of authority.

b. This permit may contain conditions that reflect necessary revisions to requirements established for this source in preconstruction permits previously issued under the authority of Title I of the CAA. These conditions are specifically designated herein as "TIR".

   i. Revisions to original Title I permit conditions are incorporated into this permit through the combined legal authority of Title I of the CAA and Title X of the Act. Public participation requirements and appeal rights shall be governed by Section 39.5 of the Act.

   ii. Revised Title I permit conditions shall remain in effect through this CAAPP permit, and are therefore enforceable under the same, so long as such conditions do not expire as a result of a failure to timely submit a complete renewal application or are not removed at the applicant's request.

c. This permit may contain conditions that reflect new requirements for this source that would ordinarily derive from a preconstruction permit established under the authority of Title I of the CAA. These conditions are specifically designated herein as "TIN".

   i. The incorporation of new Title I requirements into this CAAPP permit is authorized through the combined legal authority of Title I of the CAA and Title X of the Act. Public participation requirements and appeal rights shall be governed by Section 39.5 of the Act.

   ii. Any Title I conditions that are newly incorporated shall remain in effect through this CAAPP permit, and are therefore enforceable under the same, so long as such conditions do not expire as a result of a failure to timely submit a complete renewal application or are not removed at the applicant's request.

9. Reopening and Revising Permit

a. **Permit Actions**

This permit may be modified, revoked, reopened and reissued, or terminated for cause in accordance with applicable provisions of Section 39.5 of the Act. The filing of a request by the source for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition. [Section 39.5(7)(o)(iii) of the Act]

b. **Reopening and Revision**

Pursuant to Section 39.5(15)(a) of the Act, this permit must be reopened and revised if any of the following occur:

i. Additional requirements become applicable to the equipment covered by this permit and three or more years remain before expiration of this permit;

ii. Additional requirements become applicable to the source for acid deposition under the acid rain program;

iii. The IEPA or USEPA determines that this permit contains a material mistake or that an inaccurate statement was made in establishing the emission standards or limitations, or other terms or conditions of this permit; or

iv. The IEPA or USEPA determines that this permit must be revised or revoked to ensure compliance with the applicable requirements.

c. **Inaccurate Application**

Pursuant to Sections 39.5(5)(e) and (i) of the Act, the IEPA has issued this permit based upon the information submitted by the source in the permit application referenced on page 1 of this permit. Any misinformation, false statement or misrepresentation in the application shall be grounds for revocation or reopening of this CAAPP under Section 39.5(15) of the Act.

d. **Duty to Provide Information**

The source shall furnish to the IEPA, within a reasonable time specified by the IEPA any information that the IEPA may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. Upon request, the source shall also furnish to the IEPA copies of records required to be kept by this permit. [Section 39.5(7)(o)(v) of the Act]

10. Emissions Trading Programs

No permit revision shall be required for increases in emissions allowed under any USEPA approved economic incentives, marketable permits, emissions trading, and other similar programs or processes for changes that are provided for elsewhere in this permit and that are authorized by the applicable requirement. [Section 39.5(7)(o)(vii) of the Act]

11. Permit Renewal

a. Upon the expiration of this permit, if the source is operated, it shall be deemed to be operating without a permit unless a timely and complete CAAPP application has been submitted for renewal of this permit. However, if a timely and complete application to renew this CAAPP permit has been submitted, the terms and all conditions of the most recent issued CAAPP permit will remain in effect until the issuance of a renewal permit. [Sections 39.5(5)(l) and (o) of the Act]

b. For purposes of permit renewal, a timely application is one that is submitted no less than 9 months prior to the date of permit expiration. [Section 39.5(5)(n) of the Act]

12. Permanent Shutdown

Pursuant to Section 39.5(7)(a) of the Act, this permit only covers emission units and control equipment while physically present at the source location(s). Unless this permit specifically provides for equipment relocation, this permit is void for the operation or activity of any item of equipment on the date it is removed from the permitted location(s) or permanently shut down. This permit expires if all equipment is removed from the permitted location(s), notwithstanding the expiration date specified on this permit.

13. Startup, Shutdown, and Malfunction

Pursuant to Section 39.5(7)(a) of the Act, in the event of an action to enforce the terms or conditions of this permit, this permit does not prohibit a Permittee from invoking any affirmative defense that is provided by the applicable law or rule.

Section 3 - Source Requirements

1. Applicable Requirements

Pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act, the Permittee shall comply with the following applicable requirements. These requirements are applicable to all emission units (including insignificant activities unless specified otherwise in this Section) at the source.

a. **Fugitive Particulate Matter**

i. Pursuant to 35 IAC 212.301 and 35 IAC 212.314, no person shall cause or allow the emission of fugitive particulate matter from any process, including any material handling or storage activity, that is visible by an observer looking generally toward the zenith at a point beyond the property line of the source unless the wind speed is greater than 25 mph.

ii. Compliance Method (Fugitive Particulate Matter)

Upon request by the IEPA, the Permittee shall conduct observations at the property line of the source for visible emissions of fugitive particular matter from the source to address compliance with 35 IAC 212.301. For this purpose, daily observations shall be conducted for a week for particular area(s) of concern at the source, as specified in the request, observations shall begin either within one day or three days of receipt of a written request from the IEPA, depending, respectively, upon whether observations will be conducted by employees of the Permittee or a third-party observer hired by the Permittee to conduct observations on its behalf. The Permittee shall keep records for these observations, including identity of the observer, the date and time of observations, the location(s) from which observations were made, and duration of any fugitive emissions event(s).

b. **Ozone Depleting Substances**

Pursuant to 40 CFR 82.150(b), the Permittee shall comply with the standards for recycling and emissions reduction of ozone depleting substances pursuant to 40 CFR Part 82, Subpart F, except as provided for motor vehicle air conditioners in Subpart B of 40 CFR Part 82:

i. Pursuant to 40 CFR 82.156, persons opening appliances for maintenance, service, repair, or disposal must comply with the required practices.

ii. Pursuant to 40 CFR 82.158, equipment used during the maintenance, service, repair, or disposal of appliances must comply with the standards for recycling and recovery equipment.

iii. Pursuant to 40 CFR 82.161, persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program.

iv. Pursuant to 40 CFR 82 Subpart B, any person performing service on a motor vehicle for consideration when this service involves the refrigerant in the motor vehicle air conditioner shall comply with 40 CFR 82 Subpart B, Servicing of Motor Vehicle Air Conditioners.

v. Pursuant to 40 CFR 82.166, all persons shall comply with the reporting and recordkeeping requirements of 40 CFR 82.166.

c. **Asbestos Demolition and Renovation**

i. Asbestos Fees. Pursuant to Section 9.13(a) of the Act, for any site for which the Owner or Operator must file an original 10-day notice of intent to renovate or

demolish pursuant to Condition 3.1(b)(ii) below and 40 CFR 61.145(b), the owner or operator shall pay to the IEPA with the filing of each 10-day notice a fee of $150.00.

ii. Pursuant to 40 CFR 61 Subpart M, Standard of Asbestos, prior to any demolition or renovation at this facility, the Permittee shall fulfill notification requirements of 40 CFR 61.145(b).

iii. Pursuant to 40 CFR 61.145(c), during demolition or renovation, the Permittee shall comply with the procedures for asbestos emission control established by 40 CFR 61.145(c).

d. **NESHAP Standards (40 CFR 63 Subpart DDDDD)**

Pursuant to 40 CFR 63.7495(b), the Permittee must:

i. Meet the applicable general provisions of 40 CFR 63 Subpart A. See Condition 7.2(b).

ii. Have a one-time energy assessment performed on the source as specified in 40 CFR 63 Subpart DDDDD Table 3 Condition 3, pursuant to 40 CFR 63.7500(a)(1).

e. **Future Emission Standards**

Pursuant to Section 39.5(15)(a) of the Act, this source shall comply with any new or revised applicable future standards of 40 CFR 60, 61, 62, or 63; or 35 IAC Subtitle B after the date issued of this permit. The Permittee shall, in accordance with the applicable regulation(s), comply with the applicable requirements by the date(s) specified and shall certify compliance with the applicable requirements of such regulation(s) as part of the annual compliance certification, as required by Condition 2.6(a). This permit may also have to be revised or reopened to address such new regulations in accordance to Condition 2.9.

2. Applicable Plans and Programs

Pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act, the Permittee shall comply with the following applicable requirements. These requirements are applicable to all emission units (including insignificant activities unless specified otherwise in this Section) at the source.

a. **Fugitive PM Operating Program**

Should this source become subject to 35 IAC 212.302, the Permittee shall prepare and operate under a Fugitive PM Operating Program consistent with 35 IAC 212.310 and submitted to the IEPA for its review. The Fugitive PM Operating Program shall be designed to significantly reduce fugitive particulate matter emissions, pursuant to 35 IAC 212.309(a). Any future Fugitive PM Operating Program made by the Permittee during the permit term is automatically incorporated by reference provided the Fugitive PM Operating Program is not expressly disapproved, in writing, by the IEPA within 30 days of receipt of the Fugitive PM Operating Program. In the event that the IEPA notifies the Permittee of a deficiency with any Fugitive PM Operating Program, the Permittee shall be required to revise and resubmit the Fugitive PM Operating Program within 30 days of receipt of notification to address the deficiency pursuant to Section 39.5(7)(a) of the Act.

b. **PM_{10} Contingency Measure Plan**

Should this source become subject to 35 IAC 212.700, then the Permittee shall prepare and operate under a PM_{10} Contingency Measure Plan reflecting the PM_{10} emission reductions as set forth in 35 IAC 212.701 and 212.703. The Permittee shall, within 90 days after the

date this source becomes subject to 35 IAC 212.700, submit a request to modify this CAAPP permit in order to include a new, appropriate PM_{10} Contingency Measure Plan.

c. **Episode Action Plan**

Should this source become subject to 35 IAC 244.142, the Permittee shall prepare, submit, and operate under an Episode Action Plan for reducing the levels of emissions during yellow alerts, red alerts, and emergencies, consistent with safe operating procedures and submitted to the IEPA for its review. The Episode Action Plan shall contain the information specified in 35 IAC 244.144. The Permittee shall immediately implement the appropriate steps described in this Episode Action Plan should an air pollution alert or emergency be declared. Any future Episode Action Plan made by the Permittee during the permit term is automatically incorporated by reference provided the Episode Action Plan is not expressly disapproved, in writing, by the IEPA within 30 days of receipt of the Episode Action Plan. In the event that the IEPA notifies the Permittee of a deficiency with any Episode Action Plan, the Permittee shall be required to revise and resubmit the Episode Action Plan within 30 days of receipt of notification to address the deficiency pursuant to Section 39.5(7)(a) of the Act.

d. **Risk Management Plan (RMP)**

i. Pursuant to 40 CFR 68.215(a), the Permittee shall have a Risk Management Plan registered with the USEPA that includes information required by 40 CFR 68.150.

ii. The Permittee shall keep a copy of the Risk Management Plan and shall update the Risk Management Plan with the USEPA pursuant to 40 CFR 68.190.

3. Title I Requirements

a. i. **Construction Permit 11050010 Requirements [T1]**

A. Pursuant to Construction Permit #11050010, VOM emissions from all sterilization chambers at the Willowbrook II facility shall not exceed the following limits:. [T1]

Process	Emissions	
	Tons/Month	Tons/Year
Vacuum Pump	0.20	1.16
Back Vent	0.21	1.22
Total	0.41	2.38

ii. Compliance Method (Construction Permit #11050010)

Monitoring

A. Compliance with monthly and annual VOM emission limits in shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

Recordkeeping

B. The Permittee shall maintain the following operational and emission records for the Willowbrook II facility:

I. VOM emissions (tons/month and tons/year) with supporting calculations and documentation.

4. Synthetic Minor Limits

As of the date of issuance of this permit, there are no source-wide synthetic minor limits that need to be included in this Condition.

5. Reporting Requirements

The Permittee shall submit the following information pursuant to Section 39.5(7)(f) of the Act. Addresses are included in Attachment 3.

a. **Prompt Reporting**

i. A. Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the IEPA, Air Compliance Section, within 30 days of deviations from applicable requirements as follows:

I. Requirements in Conditions 3.1(a)(i), 3.1(b), 3.1(c), 3.1(d), and 3.1(e).

II. Requirements in Conditions 3.2(a), 3.2(b), 3.2(c), and 3.2(d).

B. All such deviations shall be summarized and reported as part of the Semiannual Monitoring Report required by Condition 3.5(b).

ii. The Permittee shall notify the IEPA, Air Compliance Section, of all other deviations as part of the Semiannual Monitoring Report required by Condition 3.5(b).

iii. The deviation reports shall contain at a minimum the following information:

A. Date and time of the deviation.

B. Emission unit(s) and/or operation involved.

C. The duration of the event.

D. Probable cause of the deviation.

E. Corrective actions or preventative measures taken.

iv. All deviation reports required in this Permit shall be identified, summarized, and reported as part of the Semiannual Monitoring Report required by Condition 3.5(b).

b. **Semiannual Reporting**

i. Pursuant to Section 39.5(7)(f)(i) of the Act, the Permittee shall submit a Semi-Annual Monitoring Report to the Illinois EPA, Air Compliance Section, summarizing required monitoring and identifying all instances of deviation from the permit, every six months as follows, unless more frequent reporting is required elsewhere in this Permit.

Monitoring Period	Report Due Date
January through June	July 31
July through December	January 31

ii. The Semiannual Monitoring Report must be certified by a Responsible Official consistent with Condition 2.6(b).

Note: Required monitoring includes all applicable monitoring, testing, recordkeeping, and reporting requirements. This may include monitoring requirements not addressed within the Compliance Method Sections of this Permit.

c. **Annual Emissions Reporting**

Pursuant to 35 IAC Part 254, the Source shall submit an Annual Emission Report to the Air Quality Planning Section, due by May 1 of the year following the calendar year in which the emissions took place. All records and calculations upon which the verified and reported data are based must be retained by the source.

Section 4 - Emission Unit Requirements

4.1 Willowbrook I Sterilization Chambers

1. Emission Units and Operations

Emission Units	*Pollutants Being Regulated*	*Original Construction Date*	*Modification/ Reconstruction Date*	*Air Pollution Control Devices or Measures*	*Monitoring Devices*
(6) Ethylene Oxide/Propylene Oxide Sterilization Chambers ((6) Pallet Capacity (SC-1))	VOM	1984	1990	Acid Water Scrubber (Scrubber #1) or Acid Water Scrubber (Scrubber #2) with Dry Bed Reactor	Level Transmitter
(6) Ethylene Oxide/Propylene Oxide Sterilization Chambers ((13) Pallet Capacity (SC-2))	VOM	1984	1998	Acid Water Scrubber (Scrubber #1) or Acid Water Scrubber (Scrubber #2) with Dry Bed Reactor	Level Transmitter
(1) Ethylene Oxide/Propylene Oxide Sterilization Chambers ((3) Pallet Capacity (SC-3))	VOM	1984	1990	Acid Water Scrubber (Scrubber #1) or Acid Water Scrubber (Scrubber #2) with Dry Bed Reactor	Level Transmitter
(1) Ethylene Oxide/Propylene Oxide Sterilization Chambers ((1) Pallet Capacity (SC-5))	VOM	1984	1990	Acid Water Scrubber (Scrubber #1) or Acid Water Scrubber (Scrubber #2) with Dry Bed Reactor	Level Transmitter

2. Applicable Requirements

For the emission units in Condition 4.1.1 above, the Permittee shall comply with the following applicable requirements pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act.

a. i. <u>Volatile Organic Material Requirements (VOM)</u>

A. Pursuant to 35 IAC 218.986, Subpart TT, every owner or operator of the above emission units shall have an emission capture and control equipment which achieves an overall reduction in uncontrolled VOM emissions of at least 81 percent from each emission unit.

ii. <u>Compliance Method (VOM Requirements)</u>

<u>Recordkeeping</u>

A. Pursuant to 35 IAC 218.991, Subpart UU, the Permittee shall collect and record all of the following information each day and maintain the information at the source for a period of three years.

I. Control device monitoring data.

II. A log of operating time for the capture system, control device, monitoring equipment and the associated emission source.

III. A maintenance log for the capture system, control device and monitoring equipment detailing all routine and non-routine maintenance performed including dates and duration of any outages.

C. Pursuant to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, the Willowbrook I Sterilization Chambers are subject to 40 CFR Part 64. The Permittee shall comply with the monitoring requirements of the CAM Plan described in Condition 7.3 and Table 7.3.1, pursuant to 40 CFR Part 64 as submitted in the Permittee's CAM plan application. At all times, the Owner or Operator shall maintain the monitoring, including but not limited to, maintaining necessary parts for routine repairs of the monitoring equipment, pursuant to 40 CFR 64.7(a) and (b).

b. i. **Hazardous Air Pollutant Requirements (HAP)**

A. Pursuant to 40 CFR 63.362(a), any source using greater than 10 tons of ethylene oxide shall reduce the emissions from the sterilization chamber vent by 99%.

ii. Compliance Method (HAP Requirements)

Monitoring

A. Pursuant to 40 CFR 63.363(b), the Permittee shall determine the efficiency of control devices used to comply with 40 IAC 63.362(c) using the test methods and procedures in 40 IAC 63.365(b) and shall operate them accordingly.

B. Pursuant to Section 39.5(7)(a) and (d), the Permittee shall inspect each scrubber once each year to ensure the proper functioning of each scrubber.

C. The operational and production requirements (4.1.2(c)(B),(C) and (D)) will insure compliance with the HAP requirement in 4.1.2(b)(i)(A).

Testing

D. Pursuant to Section 39.5(7)(b) and (d), the Permittee shall conduct a performance test to demonstrate the efficiency of one of the scrubbers within the first 18 months of the issuance of the permit and within 9 months of the receipt of the renewal CAAPP permit application. The performance test shall be conducted in accordance with 40 CFR 63.365 and all others referenced in that method. The Permittee shall comply with the applicable requirements in Condition 7.2.

E. Pursuant to Section 39.5(7)(b) and (d), the Permittee shall establish the maximum liquor tank level referenced in 40 CFR 63.365(e)(2) for each performance test.

Recordkeeping

F. Pursuant to Section 39.5(7)(a) and (e), records of the following shall be kept:

I. Records for periodic inspection of the acid water scrubber and dry bed reactor with date, individual performing the inspection, and nature of the inspection.

II. Records for prompt repair of defects, with identification and description of defect, effect on emissions, date identified, date repaired, and nature of repair.

c. i. **Operational and Production Requirements**

A. Pursuant to Construction Permit #90080038, monthly usage of propylene oxide and ethylene oxide shall not exceed 2,800 lbs and 70,000 lbs respectively. [T1]

B. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall not operate the Willowbrook I Sterilization Chambers with a level of scrubber liquor in the recirculation tank of Scrubber #2 which exceeds 159 inches or the liquor level from the most recent performance test. If Scrubber #1 is in operation, the scrubber recirculation tank shall not exceed 5,200 gallons.

C. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall exhaust no more than five of the Willowbrook I Sterilization Chambers to the acid scrubbers and dry bed reactors during the first evacuation.

D. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall keep the scrubber and recirculation tank pH below 2.

ii. Compliance Method (Operational and Production Requirements)

Monitoring

A. Compliance with annual limits shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

B. Pursuant to Section 39.5(7)(a) and (e), the Permittee shall monitor the scrubber recirculation tank of Scrubber #2. If Scrubber #1 is in operation, the level of the recirculation tank of Scrubber #1 shall be monitored.

C. Pursuant to Section 39.5(7)(a) and (e), the Permittee shall take a pH reading of the scrubber and scrubber recirculation tank when the recirculation tank is first charged with water and sulfuric acid. Following this, the pH shall be taken every week thereafter until the recirculation tank is emptied.

Recordkeeping

D. Pursuant to Section 39.5(7)(a) and (e), the following records shall be kept:

I. Ethylene oxide usage (tons/month and tons/year).

II. Propylene oxide usage (tons/month and tons/year).

III. The level of the scrubber liquor in the recirculation tank shall be recorded on a weekly basis.

IV. Records of a procedure in the control system that does not allow for more than five chambers to be evacuated during the first evacuation.

V. pH reading of the scrubber recirculation tank and scrubber for each sample taken.

3. Non-Applicability Determinations

a. The Willowbrook I Sterilization Chambers are not subject to the National Emission Standards for Hazardous Air Pollution (NESHAP) for Hospital Ethylene Oxide Sterilizers, 40 CFR Part 63 Subpart WWWWW, because the Willowbrook I Sterilization Chambers are not part of a hospital.

b. The Willowbrook I Sterilization Chambers are not subject to 35 IAC 218.301, Subpart G, because the Willowbrook I Sterilization Chambers do not use a photochemically reactive material as defined by 35 IAC 211.4690.

c. The Willowbrook I Sterilization Chambers are not subject to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, for HAP because the Willowbrook I sterilization chambers are subject to a NESHAP proposed after November 15, 1990, pursuant to 40 CFR 64.2(b)(1)(i).

4. Other Requirements

For the emission units in Condition 4.1.1 above, the Permittee shall comply with the following applicable requirements pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act.

a. **Start-up, Shutdown, and Malfunction Breakdown Requirements**

i. Authorization for Federal Requirements

a. Malfunction Breakdown Requirements

Pursuant to 40 CFR 63.362 (b), the source is authorized to continue operation in violation of the applicable requirements of Conditions 4.1.2(b)(i)(A) for HAPs during malfunction breakdown. The Permittee shall comply with all applicable requirements in Section 7.3 of this permit.

5. Reporting Requirements

The Permittee shall submit the following information pursuant to Section 39.5(7)(f) of the Act. Addresses are included in Attachment 3.

a. **Prompt Reporting**

i. A. Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the IEPA, Air Compliance Section, within 30 days of deviations from applicable requirements as follows unless a different period is specified by a particular permit provision, i.e., NSPS or NESHAP requirement:

I. Requirements in Conditions 4.1.2(a)(i), 4.1.2(b)(i), and 4.1.2(c)(i).

II. Requirements in Condition 4.1.4(a)(i).

B. All such deviations shall be summarized and reported as part of the Semiannual Monitoring Report required by Condition 3.5(b).

ii. The Permittee shall notify the IEPA, Air Compliance Section, of all other deviations as part of the Semiannual Monitoring Report required by Condition 3.5(b).

iii. The deviation reports shall contain at a minimum the following information:

A. Date and time of the deviation.

B. Emission unit(s) and/or operation involved.

C. The duration of the event.

D. Probable cause of the deviation.

E. Corrective actions or preventative measures taken.

4.2 Willowbrook II Sterilization Chambers

1. Emission Units and Operations

Emission Units	*Pollutants Being Regulated*	*Original Construction Date*	*Modification/ Reconstruction Date*	*Air Pollution Control Devices or Measures*	*Monitoring Devices*
(3) Ethylene Oxide/Propylene Oxide Sterilization Chambers ((13) Pallet Capacity (SC-4))	VOM	1999	N/A	Willowbrook II Scrubber (WBII-Scrubber) and Dry Bed Reactor	Level Transmitter
(1) Ethylene Oxide/Propylene Oxide Sterilization Chambers ((26) Pallet Capacity (SC-4))	VOM	2012	N/A	Willowbrook II Scrubber (WBII-Scrubber) and Dry Bed Reactor	Level Transmitter

2. Applicable Requirements

For the emission units in Condition 4.2.1 above, the Permittee shall comply with the following applicable requirements pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act.

a. i. **Volatile Organic Material Requirements (VOM)**

A. Pursuant to 35 IAC 218.986, Subpart TT, every owner or operator of the above emission units shall have an emission capture and control equipment which achieves an overall reduction in uncontrolled VOM emissions of at least 81 percent from each emission unit

ii. Compliance Method (VOM Requirements)

Monitoring

A. Sufficient monitoring to meet compliance with 4.2.2(a)(i)(A) is found in condition 4.2.2(b)(ii)(A).

Recordkeeping

B. Pursuant to 35 IAC 218.991, Subpart UU, the Permittee shall collect and record all of the following information each day and maintain the information at the source for a period of three years.

I. Control device monitoring data.

II. A log of operating time for the capture system, control device, monitoring equipment and the associated emission source.

III. A maintenance log for the capture system, control device and monitoring equipment detailing all routine and non-routine maintenance performed including dates and duration of any outages.

C. Pursuant to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, the Willowbrook II Sterilization Chambers are subject to 40 CFR Part 64. The Permittee shall comply with the monitoring requirements of the CAM Plan described in Condition 7.3 and Table 7.3.2, pursuant to 40 CFR Part 64 as submitted in the Permittee's CAM plan application. At all times, the Owner or Operator shall maintain the monitoring, including but not limited to, maintaining necessary parts for routine repairs of the monitoring equipment, pursuant to 40 CFR 64.7(a) and (b).

b. i. **Hazardous Air Pollutant Requirements (HAP)**

A. Pursuant to 40 CFR 63.362(a), any source using greater than 10 tons of ethylene oxide shall reduce the emissions from the sterilization chamber vent by 99%.

ii. Compliance Method (HAP Requirements)

Monitoring

A. Pursuant to 40 CFR 63.363(b), the Permittee shall determine the efficiency of control devices used to comply with 40 IAC 63.362(c) using the test methods and procedures in 40 IAC 63.365(b) and shall operate them accordingly.

B. The operational and production requirements (4.2.2(c)(B),(C) and (D)) will insure compliance with the HAP requirement in 4.2.2(b)(i)(A).

Testing

C. Pursuant to Section 39.5(7)(b) and (d), the Permittee shall conduct a performance test to demonstrate the efficiency of one of the scrubbers within the first 18 months of the issuance of the permit and within 9 months of the receipt of the renewal CAAPP permit application being sent out. The performance test shall be conducted in accordance with 40 CFR 63.365 and all others referenced in that method. The Permittee shall comply with the applicable requirements in Condition 7.2.D. Pursuant to Section 39.5(7)(b) and (d), the Permittee shall establish the maximum liquor tank level referenced in 40 CFR 63.365(e)(2) for each performance test.

Recordkeeping

E. Pursuant to Section 39.5(7)(a) and (e), records of the following shall be kept:

I. Records for periodic inspection of the acid water scrubber and dry bed reactor with date, individual performing the inspection, and nature of the inspection.

II. Records for prompt repair of defects, with identification and description of defect, effect on emissions, date identified, date repaired, and nature of repair.

III. The level of the scrubber liquor in the recirculation tank shall be recorded on a weekly basis.

c. i. **Operational and Production Requirements**

A. Pursuant to Construction Permit #11050010, the Permittee shall not use more than 20.4 tons/month and 122.1 tons/year of ethylene oxide and propylene oxide, total, for all sterilization chambers at the Willowbrook II facility. [T1]

B. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall not operate the Willowbrook II sterilization chambers with a level of scrubber liquor in the recirculation tank which exceeds 202 inches or the liquor level from the most recent performance test.

C. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall exhaust no more than three (3) Willowbrook II sterilization chambers to the acid water scrubbers and dry bed reactors during the first evacuation.

D. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall keep the scrubber and scrubber recirculation pH below 2.

ii. Compliance Method (Operational and Production Requirements)

Monitoring

A. Compliance with monthly and annual usage limits for propylene oxide and ethylene oxide shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

B. Pursuant to Section 39.5(7)(a) and (e), the Permittee shall monitor the scrubber recirculation tank level of the WBII Scrubber.

C. Pursuant to Section 39.5(7)(a) and (e), the Permittee shall take a pH reading of the scrubber and scrubber recirculation tank when the recirculation tank is first charged with water and sulfuric acid. Following this, the pH shall be taken every week thereafter until the recirculation tank is emptied.

Recordkeeping

D. Pursuant to Section 39.5(7)(a) and (e), the Permittee shall maintain the following operational and emission records for the Willowbrook II facility:

I. Ethylene oxide usage (tons/month and tons/year).

II. Propylene oxide usage (tons/month and tons/year).

III. The level of the scrubber liquor in the recirculation tank shall be recorded on a weekly basis.

IV. Records of a procedure in the control system that does not allow for more than three chambers to be evacuated.

V. pH reading of the scrubber recirculation tank and scrubber for each sample taken.

3. Non-Applicability Determinations

a. The Willowbrook II Sterilization Chambers are not subject to the National Emission Standards for Hazardous Air Pollution (NESHAP) for Hospital Ethylene Oxide Sterilizers, 40 CFR Part 63 Subpart WWWWW, because the Willowbrook II Sterilization Chambers do not reside in a hospital.

b. The Willowbrook II Sterilization Chambers are not subject to 35 IAC 218.301, Subpart G, because the Willowbrook II Sterilization Chambers do not use a photochemically reactive material as defined by 35 IAC 211.4690.

c. The Willowbrook II Sterilization Chambers are not subject to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, for ethylene oxide because the Willowbrook II Sterilization Chambers are subject to a NESHAP proposed after November 15, 1990, pursuant to 40 CFR 64.2(b)(1)(i).

d. The Willowbrook II Sterilization Chambers are not subject to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, for propylene oxide because the Willowbrook II Sterilization Chambers do not have potential pre-control device emissions of the applicable regulated air pollutant that equals or exceeds major source threshold levels.

4. Other Requirements

For the emission units in Condition 4.2.1 above, the Permittee shall comply with the following applicable requirements pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act.

a. **Start-up, Shutdown, and Malfunction Breakdown Requirements**

i. Authorization for State Requirements

a. Malfunction Breakdown Requirements

Pursuant to 35 IAC 201.149, 201.261, and 201.262, the source is authorized to continue operation in violation of the applicable requirements of Conditions 4.1.2(b)(i)(A) for HAPs during malfunction breakdown. The Permittee shall comply with all applicable requirements in Section 7.3 of this permit.

5. Reporting Requirements

The Permittee shall submit the following information pursuant to Section 39.5(7)(f) of the Act. Addresses are included in Attachment 3.

a. **Prompt Reporting**

i. A. Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the IEPA, Air Compliance Section, within 30 days of deviations from applicable requirements as follows unless a different period is specified by a particular permit provision, i.e., NSPS or NESHAP requirement:

I. Requirements in Conditions 4.2.2(a)(i), 4.2.2(b)(i), and 4.2.2(c)(i).

II. Requirements in Condition 4.2.4(a)(i).

B. All such deviations shall be summarized and reported as part of the Semiannual Monitoring Report required by Condition 3.5(b).

ii. The Permittee shall notify the IEPA, Air Compliance Section, of all other deviations as part of the Semiannual Monitoring Report required by Condition 3.5(b).

iii. The deviation reports shall contain at a minimum the following information:

A. Date and time of the deviation.

B. Emission unit(s) and/or operation involved.

C. The duration of the event.

D. Probable cause of the deviation.

E. Corrective actions or preventative measures taken.

4.3 Willowbrook I Aeration Rooms

1. Emission Units and Operations

Emission Units	*Pollutants Being Regulated*	*Original Construction Date*	*Modification/ Reconstruction Date*	*Air Pollution Control Devices or Measures*	*Monitoring Devices*
(3) Aeration Rooms (AR)	VOM	1984	1998	Acid Water Scrubber (Scrubber #2) with Dry Bed Reactor	Level Transmitter

2. Applicable Requirements

For the emission units in Condition 4.3.1 above, the Permittee shall comply with the following applicable requirements pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act.

a. i. **Volatile Organic Material Requirements (VOM)**

A. Pursuant to 35 IAC 218.986, Subpart TT, every owner or operator of the above emission units shall have an emission capture and control equipment which achieves an overall reduction in uncontrolled VOM emissions of at least 81 percent from each emission unit.

B. Pursuant to Construction Permit #96120054, the emissions of the aeration rooms shall not exceed the following VOM limits: [T1]

	Operating Hours	Volatile Organic Material Emissions	
Items of Equipment	(Hours/Year)	(Lbs/Hour)	(Tons/Year)
West Aeration Room	8,760	3.6	15.77

ii. Compliance Method (VOM Requirements)

Monitoring

A. Compliance with monthly and annual VOM emission limits for the west aeration room shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

Recordkeeping

B. Sufficient recordkeeping to meet compliance with 4.3.2(a)(i)(A) is found in condition 4.3.2(b)(ii)(B).

C. Pursuant to Section 39.5(7)(a) and (e), the Permittee shall maintain the following operational and emission records for the Willowbrook I facility:

I. Ethylene oxide usage (tons/month and tons/year).

II. Propylene oxide usage (tons/month and tons/year).

III. Calculated VOM emissions based on the efficiency of the scrubber from the most recent performance test.

D. Pursuant to 35 IAC 218.991, the Permittee shall collect and record the following information each day:

I. Control device monitoring data.

II. A log of operating time for the capture system, control device, monitoring equipment and the associated emission source.

III. A maintenance log for the capture system, control device and monitoring equipment detailing all routine and non-routine maintenance equipment detailing all routine and non-routine maintenance performed including dates and duration of any outages.

b. i. **Hazardous Air Pollutant Requirements (HAP)**

A. Pursuant to 40 CFR 63.362(d), each owner or operator of a sterilization source using 1 ton shall reduce ethylene oxide emissions to the atmosphere from each aeration room vent to a maximum concentration of 1 ppmv or by at least 99 percent, whichever is less stringent, from each aeration room vent.

ii. Compliance Method (HAP Requirements)

Monitoring

A. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall not operate the Willowbrook I aeration rooms with a level of scrubber liquor in the recirculation tank of Scrubber #2 which exceeds 159 inches or the liquor level from the most recent performance test.

B Pursuant to 40 CFR 63.363(e), the facility has complied with the emissions limits under § 63.262 with a control technology other than acid-water scrubbers or catalytic or thermal oxidizers, and has provided to the Administrator information describing the design and operation of the air pollution control system, including recommendations for the operating parameters to be monitored to demonstrate continuous compliance. The Permittee has provided an approved monitoring plan as of December 6, 2002.

Testing

C. Pursuant to the alternative monitoring plan approved on December 12, 2002, the Permittee shall collect weekly samples of the exhaust from the stack to test the concentration of ethylene oxide using a Flame Ionization Detector or the Gas Chromatograph. Modified Method 18 testing shall be used to detect the presence of ethylene oxide per the alternative monitoring plan.

Recordkeeping

D. Pursuant to Section 39.5(7)(a) and (e), records of the following shall be kept:

I. Records for periodic inspection of the acid water scrubber and dry bed reactor with date, individual performing the inspection, and nature of the inspection.

II. Records for prompt repair of defects, with identification and description of defect, effect on emissions, date identified, date repaired, and nature of repair.

III. The level of the scrubber liquor in the recirculation tank shall be recorded once per week.

E. Pursuant to Section 39.5(7)(a) and (e), records of the following shall be kept:

I. Record of the ethylene oxide concentration each week (in ppm) from the sampling period.

3. Non-Applicability Determinations

a. The Willowbrook I aeration rooms are not subject to the National Emission Standards for Hazardous Air Pollution (NESHAP) for Hospital Ethylene Oxide Sterilizers, 40 CFR Part 63 Subpart WWWWW, because the Willowbrook I aeration chambers do not reside in a hospital.

b. The Willowbrook I aeration rooms are not subject to 35 IAC 218.301, Subpart G, because the Willowbrook I aeration chambers do not use a photochemically reactive material as defined by 35 IAC 211.4690.

c. The Willowbrook I aeration rooms are not subject to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, for ethylene oxide because the Willowbrook I aeration chambers are subject to a NESHAP proposed after November 15, 1990, pursuant to 40 CFR 64.2(b)(1)(i).

d. The Willowbrook I aeration rooms are not subject to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, for propylene oxide because the Willowbrook I aeration chambers do not have potential pre-control device emissions of the applicable regulated air pollutant that equals or exceeds major source threshold levels.

4. Other Requirements

As of the date of issuance of this permit, there are no other requirements that need to be included in this Condition.

5. Reporting Requirements

The Permittee shall submit the following information pursuant to Section 39.5(7)(f) of the Act. Addresses are included in Attachment 3.

a. **Prompt Reporting**

i. A. Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the IEPA, Air Compliance Section, within 30 days of deviations from applicable requirements as follows unless a different period is specified by a particular permit provision, i.e., NSPS or NESHAP requirement:

I. Requirements in Conditions 4.3.2(a)(i), and 4.3.2(b)(i).

B. All such deviations shall be summarized and reported as part of the Semiannual Monitoring Report required by Condition 3.5(b).

ii. The Permittee shall notify the IEPA, Air Compliance Section, of all other deviations as part of the Semiannual Monitoring Report required by Condition 3.5(b).

iii. The deviation reports shall contain at a minimum the following information:

A. Date and time of the deviation.

B. Emission unit(s) and/or operation involved.

C. The duration of the event.

D. Probable cause of the deviation.

E. Corrective actions or preventative measures taken.

4.4 Willowbrook II Aeration Rooms

1. Emission Units and Operations

Emission Units	*Pollutants Being Regulated*	*Original Construction Date*	*Modification/ Reconstruction Date*	*Air Pollution Control Devices or Measures*	*Monitoring Devices*
(2) Aeration Rooms (WBII-AR)	VOM	1999	N/A	Willowbrook II Scrubber (WBII Scrubber) and Dry Bed Reactor	Level Transmitter

2. Applicable Requirements

For the emission units in Condition 4.4.1 above, the Permittee shall comply with the following applicable requirements pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act.

a. i. **Volatile Organic Material Requirements (VOM)**

A. Pursuant to 35 IAC 218.986, Subpart TT, every owner or operator of the above emission units shall have an emission capture and control equipment which achieves an overall reduction in uncontrolled VOM emissions of at least 81 percent from each emission unit.

B. Pursuant to Construction Permit #11050010, VOM emissions from all aeration rooms at the Willowbrook II facility shall not exceed the following limits: [T1]

Process	VOM Emissions	
	Tons/Month	Tons/Year
Aeration rooms	---	0.05
Total	---	0.05

ii. Compliance Method (VOM Requirements)

Monitoring

A. Compliance with monthly and annual VOM emission limits for the west aeration rooms shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

Recordkeeping

B. Sufficient recordkeeping to meet compliance with 4.3.2(a)(i)(A) is found in condition 4.3.2(b)(ii)(B).

C. Pursuant to Section 39.5(7)(a) and (e), the Permittee shall maintain the following operational and emission records for the Willowbrook II facility:

I. Calculated VOM emissions based on the efficiency of the scrubber from the most recent performance test.

D. Pursuant to 35 IAC 218.991, the Permittee shall collect and record the following information each day:

I. Control device monitoring data.

II. A log of operating time for the capture system, control device, monitoring equipment and the associated emission source.

III. A maintenance log for the capture system, control device and monitoring equipment detailing all routine and non-routine

maintenance equipment detailing all routine and non-routine maintenance performed including dates and duration of any outages.

b. i. **Hazardous Air Pollutant Requirements (HAP)**

A. Pursuant to 40 CFR 63.362(d), each owner or operator of a sterilization source using 1 ton shall reduce ethylene oxide emissions to the atmosphere from each aeration room vent to a maximum concentration of 1 ppmv or by at least 99 percent (60 ppm as per the alternative monitoring plan), whichever is less stringent, from each aeration room vent.

ii. Compliance Method (HAP Requirements)

Monitoring

A. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall not operate the Willowbrook I Sterilization Chambers with a level of scrubber liquor in the recirculation tank which exceeds 202 inches or the liquor level from the most recent performance test.

B. Pursuant to Section 39.5(7)(a) of the Act, the Permittee shall not exhaust more than one (1) aeration room to the acid water scrubber and dry bed reactor at a time.

C. Pursuant to 40 CFR 63.363(e), the facility has complied with the emissions limits under § 63.262 with a control technology other than acid-water scrubbers or catalytic or thermal oxidizers, and has provided to the Administrator information describing the design and operation of the air pollution control system, including recommendations for the operating parameters to be monitored to demonstrate continuous compliance. The Permittee has provided an approved monitoring plan as of December 6, 2002.

Testing

D. Pursuant to the alternative monitoring plan approved on December 12, 2002, the Permittee shall collect weekly samples of the exhaust from the stack to test the concentration of ethylene oxide using a Flame Ionization Detector or the Gas Chromatograph. Modified Method 18 testing shall be used to detect the presence of ethylene oxide per the alternative monitoring plan.

Recordkeeping

E. Pursuant to Section 39.5(7)(a) and (e), records of the following shall be kept:

I. Records for periodic inspection of the acid water scrubber and dry bed reactor with date, individual performing the inspection, and nature of the inspection.

II. Records for prompt repair of defects, with identification and description of defect, effect on emissions, date identified, date repaired, and nature of repair.

III. The level of the scrubber liquor in the recirculation tank shall be recorded once per week.

F. Pursuant to Section 39.5(7)(a) and (e), records of the following shall be kept:

I. Record of the ethylene oxide concentration each week (in ppm) from the sampling port.

3. Non-Applicability Determinations

a. The Willowbrook II aeration rooms are not subject to the National Emission Standards for Hazardous Air Pollution (NESHAP) for Hospital Ethylene Oxide Sterilizers, 40 CFR Part 63 Subpart WWWWW, because the Willowbrook II aeration chambers do not reside in a hospital.

b. The Willowbrook II aeration rooms are not subject to 35 IAC 218.301, Subpart G, because the Willowbrook II aeration chambers do not use a photochemically reactive material as defined by 35 IAC 211.4690.

c. The Willowbrook II aeration rooms are not subject to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, for ethylene oxide because the Willowbrook II aeration chambers are subject to a NESHAP proposed after November 15, 1990, pursuant to 40 CFR 64.2(b)(1)(i).

d. The Willowbrook II aeration rooms are not subject to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, for propylene oxide because the Willowbrook II aeration chambers do not have potential pre-control device emissions of the applicable regulated air pollutant that equals or exceeds major source threshold levels.

4. Other Requirements

As of the date of issuance of this permit, there are no other requirements that need to be included in this Condition.

5. Reporting Requirements

The Permittee shall submit the following information pursuant to Section 39.5(7)(f) of the Act. Addresses are included in Attachment 3.

a. **Prompt Reporting**

i. A. Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the IEPA, Air Compliance Section, within 30 days of deviations from applicable requirements as follows unless a different period is specified by a particular permit provision, i.e., NSPS or NESHAP requirement:

I. Requirements in Conditions 4.4.2(a)(i) and 4.4.2(b)(i).

B. All such deviations shall be summarized and reported as part of the Semiannual Monitoring Report required by Condition 3.5(b).

ii. The Permittee shall notify the IEPA, Air Compliance Section, of all other deviations as part of the Semiannual Monitoring Report required by Condition 3.5(b).

iii. The deviation reports shall contain at a minimum the following information:

A. Date and time of the deviation.

B. Emission unit(s) and/or operation involved.

C. The duration of the event.

D. Probable cause of the deviation.

E. Corrective actions or preventative measures taken.

4.5 Willowbrook I Boiler #1

1. Emission Units and Operations

Emission Units	*Pollutants Being Regulated*	*Original Construction Date*	*Modification/ Reconstruction Date*	*Air Pollution Control Devices or Measures*	*Monitoring Devices*
Cleaver Brooks Natural Gas Fired Boiler (Boiler-1, 5 mmBtu/hr)	CO, NO_x	2013	N/A	None	None

2. Applicable Requirements

For the emission units in Condition 4.5.1 above, the Permittee shall comply with the following applicable requirements pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act.

a. i. **Opacity Requirements**

A. Pursuant to 35 IAC 212.123, no person shall cause or allow the emission of smoke or other particulate matter, with an opacity greater than 30 percent, into the atmosphere from any emission unit other than those emission units subject to Section 212.122 of this Subpart.

ii. Compliance Method (Opacity Requirements)

Monitoring

A. Pursuant to Sections 39.5(7)(b) and (d) of the Act, at a minimum, the Permittee shall perform observations for opacity on the Willowbrook I Boiler #1 in accordance with Method 22 for visible emissions at least once every calendar year in which the equipment operates. If visible emissions are observed, the Permittee shall take corrective action within 4 hours of such observation. Corrective action may include, but is not limited to, shut down of the Willowbrook I Boiler #1, maintenance and repair, and/or adjustment of fuel usage. If corrective action was taken, the Permittee shall perform a follow up observation for visible emissions in accordance with Method 22. If visible emissions continue, then measurements of opacity in accordance with Method 9 and Section 7.1 shall be conducted within 7 days in accordance with Condition 2.4.

Recordkeeping

B. Pursuant to Section 39.5(7)(b) of the Act, the Permittee shall keep records for each opacity observation performed. These records shall include, at a minimum: date and time the observation was performed, name(s) of observing personnel, identification of which equipment was observed, whether or not the equipment was running properly, the findings of the observation including the presence of any visible emissions, and a description of any corrective action taken including if the corrective action took place within 4 hours of the observation.

C. Pursuant to Section 39.5(7)(b) of the Act, the Permittee shall keep records for all Method 22 and Method 9 opacity measurements made in accordance with Condition 4.4.2(a)(ii)(A) above.

b. i. **Carbon Monoxide Requirements (CO)**

A. Pursuant to Construction Permit #12090024, the Boiler shall not exceed the following CO emission: [T1]

Pollutant	Limits	
	(Lb/Hour)	(Tons/Year)
CO	0.4	1.8

ii. Compliance Method (CO Requirements)

Monitoring

A. Compliance with monthly and annual CO emission limits for the Willowbrook I Boiler #1 shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

B. Pursuant to 40 CFR 63.7540(10(iv), the Permittee shall optimize CO emissions during the boiler tune-up.

Recordkeeping

C. Pursuant to Section 39.5(7)(b) and (e) of the Act, the Permittee shall keep records for the following:

I. Monthly and annual emissions of CO emissions (tons/month and tons/year) with supporting data or calculations.

II. Records of that the CO emissions were optimized during the tune-up.

c. i. **Nitrogen Oxide Requirements (NO_x)**

A. Pursuant to Construction Permit #12090024, the boiler shall not exceed the following NO_x emission limit: [T1]

Pollutant	Limits	
	(Lb/Hour)	(Tons/Year)
NO_x	0.5	2.2

ii. Compliance Method (NO_x Requirements)

A. Compliance with monthly and annual NO_x emission limits for the Willowbrook I Boiler #1 shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

Recordkeeping

B. Pursuant to Section 39.5(7)(b) and (e) of the Act, the Permittee shall keep records for the following:

Monthly and annual emissions of NO_x emissions (tons/month and tons/year) with supporting data or calculations.

d. i. **Operational and Production Requirements**

A. Pursuant to Section 39.5(7)(a) of the Act, pipeline quality natural gas shall be the only fuel fired in the Willowbrook I Boiler #1.

ii. Compliance Method (Operational and Production Requirements)

Recordkeeping

A. The Permittee shall keep a record of the fuel usage and type of fuel used in the Willowbrook I Boiler #1.

e. i. **Work Practice Requirements**

A. Pursuant to 40 CFR 63.7500(e), NESHAP Subpart DDDDD, the Permittee must complete a tune-up every 5 years as specified in 40 CFR 63.7540(10)(i)-(iv).

ii. Compliance Method (Work Practice Requirements)

Recordkeeping

A. Pursuant to Section 39.5(7)(a) and (e), the Permittee shall maintain records of the following:

I. Date of the tune-up

II. Names of personnel completing the tune-up

III. All adjustments/corrective actions (i.e. to the flame pattern, air-to-fuel ratio, CO emissions)

3. Non-Applicability Determinations

a. The Willowbrook I Boiler #1 not subject to the New Source Performance Standards (NSPS) for Small Industrial-Commercial-Institutional Steam Generating Units, 40 CFR Part 60 Subpart Dc, because the Willowbrook I Boiler #1 has a firing rate below 2.9 MW(10 mmBtu).

b. The Willowbrook I Boiler #1 are not subject to the National Emission Standards for Hazardous Air Pollution (NESHAP) for Industrial, Commercial and Institutional Boilers and Process Heaters, 40 CFR Part 63 Subpart JJJJJJ, because the Willowbrook I Boiler #1 is a major source that fires natural gas.

c. The Willowbrook I Boiler #1 is not subject to 35 IAC 212.201, because the Willowbrook I Boiler #1 does not fire solid fuel and solely fires natural gas.

d. The Willowbrook I Boiler #1 is not subject to 35 IAC 214.122, because the Willowbrook I Boiler #1 does not fire solid or liquid fuel and solely fires natural gas.

e. The Willowbrook I Boiler #1 is not subject to 35 IAC 215.301, because the Willowbrook I Boiler #1 is fuel combustion sources which are exempt from the rule, pursuant to 35 IAC 215.303.

f. The Willowbrook I Boiler #1 not subject to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, because the Willowbrook I Boiler #1 do not use an add-on control device to achieve compliance with an emission limitation.

4. Other Requirements

As of the date of issuance of this permit, there are no other requirements that need to be included in this Condition.

5. Reporting Requirements

The Permittee shall submit the following information pursuant to Section 39.5(7)(f) of the Act. Addresses are included in Attachment 3.

a. **Prompt Reporting**

i. A. Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the IEPA, Air Compliance Section, within 30 days of deviations from applicable requirements as follows unless a different period is specified by a particular permit provision, i.e., NSPS or NESHAP requirement:

I. Requirements in Conditions 4.5.2(a)(i), 4.5.2(b)(i), 4.5.2(c)(i),. 4.5.2(d)(i), and 4.5.2(e)(i).

B. All such deviations shall be summarized and reported as part of the Semiannual Monitoring Report required by Condition 3.5(b).

ii. The Permittee shall notify the IEPA, Air Compliance Section, of all other deviations as part of the Semiannual Monitoring Report required by Condition 3.5(b).

iii. The deviation reports shall contain at a minimum the following information:

A. Date and time of the deviation.

B. Emission unit(s) and/or operation involved.

C. The duration of the event.

D. Probable cause of the deviation.

E. Corrective actions or preventative measures taken.

4.6 Willowbrook II Boilers #1 and #2

1. Emission Units and Operations

Emission Units	*Pollutants Being Regulated*	*Original Construction Date*	*Modification/ Reconstruction Date*	*Air Pollution Control Devices or Measures*	*Monitoring Devices*
Kewanee Model L35-80-G Natural Gas Fired Boiler (WBII - Boiler-1, 3.3 mmBtu/hr)	PM, CO, NO_x, SO_2, VOM	1999	N/A	None	None
Kewanee Model L35-80-G Natural Gas Fired Boiler (WBII - Boiler-2, 3.3 mmBtu/hr)	PM, CO, NO_x, SO_2, VOM	1999	N/A	None	None

2. Applicable Requirements

a. i. **Opacity Requirements**

A. Pursuant to 35 IAC 212.123, no person shall cause or allow the emission of smoke or other particulate matter, with an opacity greater than 30 percent, into the atmosphere from any emission unit other than those emission units subject to Section 212.122 of this Subpart.

ii. Compliance Method (Opacity Requirements)

Monitoring

A. Pursuant to Sections 39.5(7)(b) and (d) of the Act, at a minimum, the Permittee shall perform observations for opacity on the Willowbrook II Boilers #1 and #2 in accordance with Method 22 for visible emissions at least once every calendar year in which the equipment operates. If visible emissions are observed, the Permittee shall take corrective action within 4 hours of such observation. Corrective action may include, but is not limited to, shut down of the pipeline heaters and Boilers, maintenance and repair, and/or adjustment of fuel usage. If corrective action was taken, the Permittee shall perform a follow up observation for visible emissions in accordance with Method 22. If visible emissions continue, then measurements of opacity in accordance with Method 9 and Section 7.1 shall be conducted within 7 days in accordance with Condition 2.4.

Recordkeeping

B. Pursuant to Section 39.5(7)(b) of the Act, the Permittee shall keep records for each opacity observation performed. These records shall include, at a minimum: date and time the observation was performed, name(s) of observing personnel, identification of which equipment was observed, whether or not the equipment was running properly, the findings of the observation including the presence of any visible emissions, and a description of any corrective action taken including if the corrective action took place within 4 hours of the observation.

C. Pursuant to Section 39.5(7)(b) of the Act, the Permittee shall keep records for all Method 22 and Method 9 opacity measurements made in accordance with Condition 4.4.2(a)(ii)(A) above.

b. i. **Operational and Production Requirements**

A. Pursuant to Section 39.5(7)(a) of the Act, pipeline quality natural gas shall be the only fuel fired in the Willowbrook II Boilers #1 and #2.

ii. Compliance Method (Operational and Production Requirements)

Recordkeeping

A. The Permittee shall keep a record of the fuel usage and type of fuel used in the Willowbrook II Boilers #1 and #2.

c. i. **Work Practice Requirements**

A. Pursuant to 40 CFR 63.7500(e), the Permittee must complete a tune-up every 5 years as specified in 40 CFR 63.7540(10)(i)-(iv).

ii. Compliance Method (Work Practice Requirements)

Recordkeeping

A. Pursuant to Section 39.5(7)(a) and (e), the Permittee shall maintain records of the following:

I. Date of the tune-up.

II. Names of personnel completing the tune-up.

III. All adjustments/corrective actions (i.e. to the flame pattern, air-to-fuel ratio, CO emissions).

3. Non-Applicability Determinations

a. The Willowbrook II Boilers #1 and #2 are not subject to the New Source Performance Standards (NSPS) for Small Industrial-Commercial-Institutional Steam Generating Units, 40 CFR Part 60 Subpart Dc, because the Willowbrook II Boilers #1 and #2 have a firing rate below 2.9 MW(10 mmBtu).

b. The Willowbrook II boiler #1 and #2 are not subject to the National Emission Standards for Hazardous Air Pollution (NESHAP) for Industrial, Commercial and Institutional Boilers and Process Heaters, 40 CFR Part 63 Subpart JJJJJJ, because the Willowbrook II Boilers #1 and #2 are a major sources that only fires natural gas.

c. The Willowbrook II boiler #1 and #2 are not subject to 35 IAC 212.201, because the Willowbrook II Boilers #1 and #2 do not fire solid fuel and solely fire natural gas.

d. The Willowbrook II boiler #1 and #2 are not subject to 35 IAC 214.122, because the Willowbrook II Boilers #1 and #2 do not fire solid or liquid fuel and solely fire natural gas.

e. The Willowbrook II boiler #1 and #2 are not subject to 35 IAC 215.301, because the Willowbrook II Boilers #1 and #2 are fuel combustion sources which are exempt from the rule, pursuant 35 IAC 215.303.

f. The Willowbrook II boiler #1 and #2 are not subject to 35 IAC 216.121, because Willowbrook II Boilers #1 and #2 have an actual heat input less than 2.9 MW (10 mmBtu/hr).

g. The Willowbrook II boiler #1 and #2 are not subject to 35 IAC 217.141, because the Willowbrook II Boilers #1 and #2 have an actual heat input less than 73.2 MW (250 mmBtu/hr) and are not located in the Chicago.

h. The Willowbrook II Boilers #1 and #2 not subject to 40 CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources, because the Willowbrook II Boilers #1 and #2 do not use an add-on control device to achieve compliance with an emission limitation or standard and do not have potential pre-control device emissions of the applicable regulated air pollutant that equals or exceeds major source threshold levels.

4. Other Requirements

As of the date of issuance of this permit, there are no other requirements that need to be included in this Condition.

5. Reporting Requirements

The Permittee shall submit the following information pursuant to Section 39.5(7)(f) of the Act. Addresses are included in Attachment 3.

a. **Prompt Reporting**

i. A. Pursuant to Section 39.5(7)(f)(ii) of the Act, the Permittee shall promptly notify the IEPA, Air Compliance Section, within 30 days of deviations from applicable requirements as follows unless a different period is specified by a particular permit provision, i.e., NSPS or NESHAP requirement:

I. Requirements in Conditions 4.6.2(a)(i), 4.6.2(b)(i), and 4.6.2(c)(i).

B. All such deviations shall be summarized and reported as part of the Semiannual Monitoring Report required by Condition 3.5(b).

ii. The Permittee shall notify the IEPA, Air Compliance Section, of all other deviations as part of the Semiannual Monitoring Report required by Condition 3.5(b).

iii. The deviation reports shall contain at a minimum the following information:

A. Date and time of the deviation.

B. Emission unit(s) and/or operation involved.

C. The duration of the event.

D. Probable cause of the deviation.

E. Corrective actions or preventative measures taken.

Section 5 - Additional Title I Requirements

This Section is reserved for Title I requirements not specified in Sections 3 or 4. As of the date of issuance of this permit, there are no Title I requirements that need to be separately addressed in this Section.

Section 6 - Insignificant Activities Requirements

1. Insignificant Activities Subject to Specific Regulations

Pursuant to 35 IAC 201.210 and 201.211, the following activities at the source constitute insignificant activities. Pursuant to Sections 9.1(d) and 39.5(6)(a) of the Act, the insignificant activities are subject to specific standards promulgated pursuant to Sections 111, 112, 165, or 173 of the Clean Air Act. The Permittee shall comply with the following applicable requirements:

Insignificant Activity	*Number of Units*	*Insignificant Activity Category*
Direct combustion units used for comfort heating and fuel combustion emission units as further detailed in 35 IAC 201.210(a)(4).	2	35 IAC 201.210(a)(4)

a. **Applicable Requirements**

Pursuant to Sections 39.5(7)(a), 39.5(7)(b), and 39.5(7)(d) of the Act, the Permittee shall comply with the following applicable requirements in addition to the applicable requirements in Condition 6.4:

i. **National Emission Standards for Hazardous Air Pollutants (NESHAP)**

A. Pursuant to 40 CFR 63.7500(e), the Permittee must complete a tune-up every 5 years as specified in 40 CFR 63.7540(10)(i)-(iv).

2. Insignificant Activities in 35 IAC 201.210(a)

In addition to any insignificant activities identified in Condition 6.1, the following additional activities at the source constitute insignificant activities pursuant to 35 IAC 201.210 and 201.211:

Insignificant Activity	*Number of Units*	*Insignificant Activity Category*
Storage tanks < 10,000 gallon with annual throughput < 100,000 gallon (not storing gasoline or any material listed as a HAP).	9	35 IAC 201.210(a)(10)

3. Insignificant Activities in 35 IAC 201.210(b)

Pursuant to 35 IAC 201.210, the source has identified insignificant activities as listed in 35 IAC 201.210(b)(1) through (28) as being present at the source. The source is not required to individually list the activities.

4. Applicable Requirements

Insignificant activities in Conditions 6.1 and 6.2 are subject to the following general regulatory limits notwithstanding status as insignificant activities. The Permittee shall comply with the following requirements, as applicable:

a. Pursuant to 35 IAC 212.123(a), no person shall cause or allow the emission of smoke or other particulate matter, with an opacity greater than 30 percent, into the atmosphere from any emission unit other than those emission units subject to 35 IAC 212.122, except as provided in 35 IAC 212.123(b).

b. Pursuant to 35 IAC 214.301, no person shall cause or allow the emission of sulfur dioxide into the atmosphere from any process emission source to exceed 2,000 ppm, except as provided in 35 IAC Part 214.

c. Pursuant to 35 IAC 218.301, no person shall cause or allow the discharge of more than 8 lbs/hr of organic material into the atmosphere from any emission source, except as provided in 35 IAC 218.302, 218.303, 218.304 and the following exception: If no odor nuisance exists the limitation of 35 IAC 215 Subpart K shall apply only to photochemically reactive material.

d. Pursuant to 35 IAC 218.122(b), no person shall cause or allow the loading of any organic material into any stationary tank having a storage capacity of greater than 250 gal, unless such tank is equipped with a permanent submerged loading pipe, submerged fill, or an equivalent device approved by the IEPA according to 35 IAC Part 201 or unless such tank is a pressure tank as described in 35 IAC 215.121(a) or is fitted with a recovery system as described in 35 IAC 215.121(b)(2). Exception as provided in 35 IAC 218.122(c): If no odor nuisance exists the limitations of 35 IAC 215.122 shall only apply to the loading of volatile organic liquid with a vapor pressure of 2.5 psia or greater at 70°F.

e. Pursuant to 35 IAC 218 Subpart TT, VOM emissions from each insignificant activities that is exempt from 35 IAC 218 Subpart TT shall not equal or exceed 2.5 tons per calendar year; and total VOM emissions from insignificant activities, in conjunction with applicable emission units in Section 4 of this permit not complying with 35 IAC 218.986, shall not exceed 5.0 tons per calendar year.

f. Pursuant to 35 IAC 218 Subpart RR, VOM emissions from each insignificant activities that is exempt from 35 IAC 218 Subpart RR shall not equal or exceed 1.0 tons per calendar year; and total VOM emissions from insignificant activities, in conjunction with applicable emission units in Section 4 of this permit not complying with 35 IAC 218.966, shall not exceed 5.0 tons per calendar year.

5. Compliance Method

Pursuant to Section 39.5(7)(b) of the Act, the source shall maintain records of the following items for the insignificant activities in Conditions 6.1 and 6.2:

a. List of all insignificant activities, including insignificant activities added as specified in Condition 6.6, the categories the insignificant activities fall under, and supporting calculations as needed for any insignificant activities listed in 35 IAC 201.210(a)(1) through (3).

b. Potential to emit emission calculations before any air pollution control device for any insignificant activities listed in 35 IAC 201.210(a)(1) through (3).

6. Notification Requirements for Insignificant Activities

The source shall notify the IEPA accordingly to the addition of insignificant activities:

a. <u>Notification 7 Days in Advance</u>

i. Pursuant to 35 IAC 201.212(b), for the addition of an insignificant activity that would be categorized under 35 IAC 201.210(a)(1) and 201.211 and is not currently identified in Conditions 6.1 or 6.2, a notification to the IEPA Permit Section 7 days in advance of the addition of the insignificant activity is required. Addresses are included in Attachment 3. The notification shall include the following pursuant to 35 IAC 201.211(b):

A. A description of the emission unit including the function and expected operating schedule of the unit.

B. A description of any air pollution control equipment or control measures associated with the emission unit.

C. The emissions of regulated air pollutants in lbs/hr and tons/yr.

D. The means by which emissions were determined or estimated.

E. The estimated number of such emission units at the source.

F. Other information upon which the applicant relies to support treatment of such emission unit as an insignificant activity.

ii. Pursuant to 35 IAC 201.212(b), for the addition of an insignificant activity that would be categorized under 35 IAC 201.210(a)(2) through 201.210(a)(18) and is not currently identified in Conditions 6.1 or 6.2, a notification to the IEPA Permit Section 7 days in advance of the addition of the insignificant activity is required. Addresses are included in Attachment 3.

iii. Pursuant to Sections 39.5(12)(a)(i)(b) and 39.5(12)(b)(iii) of the Act, the permit shield described in Section 39.5(7)(j) of the Act (see Condition 2.7) shall not apply to any addition of an insignificant activity noted above.

b. Notification Required at Renewal

Pursuant to 35 IAC 201.212(a) and 35 IAC 201.146(kkk), for the addition of an insignificant activity that would be categorized under 35 IAC 201.210(a) and is currently identified in Conditions 6.1 or 6.2, a notification is not required until the renewal of this permit.

c. Notification Not Required

Pursuant to 35 IAC 201.212(c) and 35 IAC 201.146(kkk), for the addition of an insignificant activity that would be categorized under 35 IAC 201.210(b) as describe in Condition 6.3, a notification is not required.

Section 7 - Other Requirements

1. Testing

a. Pursuant to Section 39.5(7)(a) of the Act, a written test protocol shall be submitted at least sixty (60) days prior to the actual date of testing, unless it is required otherwise in applicable state or federal statutes. The IEPA may at the discretion of the Compliance Section Manager (or designee) accept protocol less than 60 days prior to testing provided it does not interfere with the IEPA's ability to review and comment on the protocol and does not deviate from the applicable state or federal statutes. The protocol shall be submitted to the IEPA, Compliance Section and IEPA, Stack Test Specialist for its review. Addresses are included in Attachment 3. This protocol shall describe the specific procedures for testing, including as a minimum:

i. The name and identification of the emission unit(s) being tested.

ii. Purpose of the test, i.e., permit condition requirement, IEPA or USEPA requesting test.

iii. The person(s) who will be performing sampling and analysis and their experience with similar tests.

iv. The specific conditions under which testing will be performed, including a discussion of why these conditions will be representative of maximum emissions and the means by which the operating parameters for the emission unit and any control equipment will be determined.

v. The specific determinations of emissions and operation which are intended to be made, including sampling and monitoring locations.

vi. The test method(s) that will be used, with the specific analysis method, if the method can be used with different analysis methods. Include if emission tests averaging of 35 IAC 283 will be used.

vii. Any minor changes in standard methodology proposed to accommodate the specific circumstances of testing, with detailed justification. This shall be included as a waiver of the test procedures. If a waiver has already been obtained by the IEPA or USEPA, then the waiver shall be submitted.

viii. Any proposed use of an alternative test method, with detailed justification. This shall be included as a waiver of the test procedures. If a waiver has already been obtained by the IEPA or USEPA, then the waiver shall be submitted.

ix. Sampling of materials, QA/QC procedures, inspections, etc.

b. The IEPA, Compliance Section shall be notified prior to these tests to enable the IEPA to observe these tests pursuant to Section 39.5(7)(a) of the Act as follows:

i. Notification of the expected date of testing shall be submitted in writing a minimum of thirty (30) days prior to the expected test date, unless it is required otherwise in applicable state or federal statutes.

ii. Notification of the actual date and expected time of testing shall be submitted in writing a minimum of five (5) working days prior to the actual date of the test. The IEPA may at its discretion of the Compliance Section Manager (or designee) accept notifications with shorter advance notice provided such notifications will not interfere with the IEPA's ability to observe testing.

c. Copies of the Final Report(s) for these tests shall be submitted to the IEPA, Compliance Section within fourteen (14) days after the test results are compiled and finalized but

no later than ninety (90) days after completion of the test, unless it is required otherwise in applicable state or federal statutes or the IEPA may at the discretion of the Compliance Section Manager (or designee) an alternative date is agreed upon in advance pursuant to Section 39.5(7)(a) of the Act. The Final Report shall include as a minimum:

i. General information including emission unit(s) tested.

ii. A summary of results.

iii. Discussion of conditions during each test run (malfunction/breakdown, startup/shutdown, abnormal processing, etc.).

iv. Description of test method(s), including description of sampling points, sampling train, analysis equipment, and test schedule.

v. Detailed description of test conditions, including:

A. Process information, i.e., mode(s) of operation, process rate, e.g. fuel or raw material consumption.

B. Control equipment information, i.e., equipment condition and operating parameters during testing.

C. A discussion of any preparatory actions taken, i.e., inspections, maintenance and repair.

vi. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration.

vii. An explanation of any discrepancies among individual tests or anomalous data.

viii. Results of the sampling of materials, QA/QC procedures, inspections, etc.

ix. Discussion of whether protocol was followed and description of any changes to the protocol if any occurred.

x. Demonstration of compliance showing whether test results are in compliance with applicable state or federal statutes.

d. Copies of all test reports and other test related documentation shall be kept on site as required by Condition 2.5(b) pursuant to Section 39.5(7)(e)(ii) of the Act.

2. 40 CFR 63 Subpart A Requirements (NESHAP)

a. 40 CFR 63 Subpart A and Subpart O - Ethylene Oxide Emissions Standards for Sterilization Facilities

Pursuant to 40 CFR 63 Subpart A and Subpart O, the Permittee shall comply with the following applicable General Provisions as indicated:

TABLE 1 OF SECTION 63.360 — GENERAL PROVISIONS APPLICABILITY TO SUBPART O

Reference	Applies to sources using 10 tons in Subpart O[a]	Applies to sources using 1 to 10 tons in Subpart O[a]	Comment
63.1(a)(1)	Yes		Additional terms defined in §63.361; when overlap between Subparts A and O occurs, Subpart O takes precedence.
63.1(a)(2)	Yes		
63.1(a)(3)	Yes		
63.1(a)(4)	Yes		Subpart O clarifies the applicability of each paragraph in Subpart A to sources subject to Subpart O.
63.1(a)(5)	No		Reserved.
63.1(a)(6)	Yes		
63.1(a)(7)	Yes		
63.1.1(a)(8)	Yes		
63.1(a)(9)	No		Reserved.
63.1(a)(10)	Yes		
63.1(a)(11)	Yes		§63.366(a) of Subpart O also allows report submissions via fax and on electronic media.
63.1(a)(12)-(14)	Yes		
63.1(b)(1)-(2)	Yes		
63.1(b)(3)	No		§63.367 clarifies the applicability of recordkeeping requirements for sources that determine they are not subject to the emissions standards.
63.1(c)(1)	Yes		Subpart O clarifies the applicability of each paragraph in Subpart A to sources subject to Subpart O in this Table.
63.1(c)(2)	Yes		§63.360(f) exempts area sources subject to this Subpart from the obligation to obtain Title V operating permits.
63.1(c)(3)	No		Reserved.
63.1(c)(4)	Yes		
63.1(c)(5)	No		§63.360 specifies applicability.
63.1(d)	No		Reserved.
63.1(e)	Yes		
63.2	Yes		Additional terms defined in §63.361; when overlap between Subparts A and O occurs, Subpart O takes precedence.

Reference	Applies to sources using 10 tons in Subpart O[a]	Applies to sources using 1 to 10 tons in Subpart O[a]	Comment
63.3	Yes		Other units used in Subpart O are defined in the text of Subpart O.
63.4(a)(1)-(3)	Yes		
63.4(a)(4)	No		Reserved.
63.4(a)(5)	Yes		
63.4(b)	Yes		
63.4(c)	Yes		
63.5(a)	No		§63.366(b)(1) contains applicability requirements for constructed or reconstructed sources.
63.5(b)(1)	Yes	No	
63.5(b)(2)	No		Reserved.
63.5(b)(3)	No		See §63.366(b)(2).
63.5(b)(4)	Yes	No	
63.5(b)(5)	Yes	No	
63.5(b)(6)	Yes	No	
63.5(c)	No		Reserved.
63.5(d)(1)-(2)	No		See §63.366(b)(3).
63.5(d)(3)-(4)	Yes	No	
63.5(e)	Yes	No	
63.5(f)(1)-(2)	No		See §63.366(b)(4).
63.6(a)(1)	Yes		
63.6(a)(2)	No		§63.360 specifies applicability.
63.6(b)-(c)	No		§63.360(g) specifies compliance dates for sources.
63.6(d)	No		Reserved.
63.6(e)	No		Subpart O does not contain any operation and maintenance plan requirements.
63.6(f)(1)	No		§63.362(b) specifies when the standards apply.
63.6(f)(2)(i)	Yes		
63.6(f)(2)(ii)	No		§63.363 specifies parameters for determining compliance.
63.6(f)(2)(iii)-(iv)	Yes		
63.6(f)(2)(v)	No		
63.6(f)(3)	Yes		
63.6(g)	Yes		
63.6(h)	No		Subpart O does not contain any opacity or visible emission standards.
63.6(i)(1)-(14)	Yes		

Reference	Applies to sources using 10 tons in Subpart O[a]	Applies to sources using 1 to 10 tons in Subpart O[a]	Comment
63.6(i)(15)	No		Reserved
63.6(i)(16)	Yes		
63.6(j)	Yes		
63.7(a)(1)	Yes		
63.7(a)(2)	Yes		
63.7(a)(3)	Yes		
63.7(b)	Yes		
63.7(c)	Yes	No	
63.7(d)	Yes	No	
63.7(e)	Yes		§63.365 also contains test methods specific to sources subject to the emissions standards.
63.7(f)	Yes		
63.7(g)(1)	Yes		
63.7(g)(2)	No		Reserved
63.7(g)(3)	Yes		
63.7(h)	Yes		
63.8(a)(1)	Yes		
63.8(a)(2)	Yes		
63.8(a)(3)	No		Reserved
63.8(a)(4)	Yes		
63.8(b)(1)	Yes		
63.8(b)(2)	Yes		
63.8(b)(3)	No		
63.8(c)(1) (i)-(ii)	No		A startup, shutdown, and malfunction plan is not required for these standards.
63.8(c)(1)(iii)	Yes		
63.8(c)(2)-(3)	Yes		
63.8(c)(4)-(5)	No		Frequency of monitoring measurements is provided in §63.364; opacity monitors are not required for these standards.
63.8(c)(6)	No		Performance specifications for gas chromatographs and temperature monitors are contained in §63.365.
63.8(c)(7)(i)(A)-(B)	No		Performance specifications for gas chromatographs and temperature monitors are contained in §63.365.
63.8(c)(7)(i)(C)	No		Opacity monitors are not required for these standards.
63.8(c)(7)(ii)	No		Performance specifications for gas chromatographs and temperature monitors are contained in §63.365.
63.8(c)(8)	No		

Reference	Applies to sources using 10 tons in Subpart O[a]	Applies to sources using 1 to 10 tons in Subpart O[a]	Comment
63.8(d)	Yes	No	
63.8(e)(1)	Yes		
63.8(e)(2)	Yes		
63.8(e)(3)	Yes	No	
63.8(e)(4)	Yes		
63.8(e)(5)(i)	Yes		
63.8(e)(5)(ii)	No		Opacity monitors are not required for these standards.
63.8(f)(1)-(5)	Yes		
63.8(f)(6)	No		
63.8(g)(1)	Yes		
63.8(g)(2)	No		
63.8(g)(3)-(5)	Yes		
63.9(a)	Yes		
63.9(b)(1)-(i)	Yes		
63.9(b)(1)(ii)-(iii)	No		§63.366(c)(1)(i) contains language for sources that increase usage such that the source becomes subject to the emissions standards.
63.9(b)(2)-(3)	Yes		§63.366(c)(3) contains additional information to be included in the initial report for existing and new sources.
63.9(b)(4)-(5)	No		§63.366(c)(1)(ii) and (iii) contains requirements for new or reconstructed sources subject to the emissions standards.
63.9(c)	Yes		
63.9(d)	No		
63.9(e)	Yes		
63.9(f)	No		Opacity monitors are not required for these standards.
63.9(g)(1)	Yes		
63.9(g)(2)-(3)	No		Opacity monitors and relative accuracy testing are not required for these standards.
63.9(h)(1)-(3)	Yes		
63.9(h)(4)	No		Reserved.
63.9(h)(5)	No		§63.366(c)(2) instructs sources to submit actual data.
63.9(h)(6)	Yes		
63.9(i)	Yes		
63.9(j)	Yes		
63.10(a)	Yes		

Reference	Applies to sources using 10 tons in Subpart O[a]	Applies to sources using 1 to 10 tons in Subpart O[a]	Comment
63.10(b)(1)	Yes		
63.10(b)(2)(i)	No		Not applicable due to batch nature of the industry.
63.10(b)(2)(ii)	Yes		
63.10(b)(2)(iii)	No		
63.10(b)(2)(iv)-(v)	No		A startup, shutdown, and malfunction plan is not required for these standards.
63.10(b)(2)(vi)-(xii)	Yes		
63.10(b)(2)(xiii)	No		
63.10(b)(2)(xiv)	Yes		
63.10(b)(3)	No		§63.367 (b) and (c) contains applicability determination requirements.
63.10(c)(1)	Yes		
63.10(c)(2)-(4)	No		Reserved.
63.10(c)(5)	Yes		
63.10(c)(6)	No		
63.10(c)(7)	No		Not applicable due to batch nature of the industry.
63.10(c)(8)	Yes		
63.10(c)(9)	No		
63.10(c)(10)-(13)	Yes		
63.10(c)(14)	Yes	No	
63.10(c)(15)	No		A startup, shutdown, and malfunction plan is not required for these standards.
63.10(d)(1)	Yes		
63.10(d)(2)	Yes		
63.10(d)(3)	No		Subpart O does not contain opacity or visible emissions standards.
63.10(d)(4)	Yes		
63.10(d)(5)	No		A startup, shutdown, and malfunction plan is not required for these standards.
63.10(e)(1)	Yes		
63.10(e)(2)(i)	Yes		
63.10(e)(2)(ii)	No		Opacity monitors are not required for these standards.
63.10(e)(3)(i)-(iv)	Yes		
63.10(e)(3)(v)	No		§63.366(a)(3) specifies contents and submittal dates for excess emissions and monitoring system performance reports.

Reference	Applies to sources using 10 tons in Subpart O[a]	Applies to sources using 1 to 10 tons in Subpart O[a]	Comment
63.10(e)(3)(vi)-(viii)	Yes		
63.10(e)(4)	No		Opacity monitors are not required for these standards.
63.10(f)	Yes		
63.11	Yes		
63.12-63.15	Yes		

b. **40 CFR 63 Subpart A and Subpart DDDDD - Industrial, Commercial, and Institutional Boilers and Process Heaters**

Pursuant to 40 CFR 63 Subpart A and Subpart DDDDD, the Permittee shall comply with the following applicable General Provisions as indicated:

Citation	Subject	Applies to Subpart DDDDD
§63.1	Applicability	Yes
§63.2	Definitions	Yes. Additional terms defined in §63.7575
§63.3	Units and Abbreviations	Yes
§63.4	Prohibited Activities and Circumvention	Yes
§63.5	Preconstruction Review and Notification Requirements	Yes
§63.6(a), (b)(1)-(b)(5), (b)(7), (c)	Compliance with Standards and Maintenance Requirements	Yes
§63.6(e)(1)(i)	General duty to minimize emissions.	No. See §63.7500(a)(3) for the general duty requirement.
§63.6(e)(1)(ii)	Requirement to correct malfunctions as soon as practicable.	No
§63.6(e)(3)	Startup, shutdown, and malfunction plan requirements.	No
§63.6(f)(1)	Startup, shutdown, and malfunction exemptions for compliance with non-opacity emission standards.	No
§63.6(f)(2) and (3)	Compliance with non-opacity emission standards.	Yes
§63.6(g)	Use of alternative standards	Yes
§63.6(h)(1)	Startup, shutdown, and malfunction exemptions to opacity standards.	No. See §63.7500(a).
§63.6(h)(2) to (h)(9)	Determining compliance with opacity emission standards	Yes
§63.6(i)	Extension of compliance	Yes. Note: Facilities may also request extension ns of compliance for the installation of combined heat and power, waste heat recovery, or gas pipeline or fuel feeding infrastructure as a means of complying with this Subpart.
§63.6(j)	Presidential exemption.	Yes
§63.7(a), (b), (c), and (d)	Performance Testing Requirements	Yes

Citation	Subject	Applies to Subpart DDDDD
§63.7(e)(1)	Conditions for conducting performance tests	No. Subpart DDDDD specifies conditions for conducting performance tests at §63.7520(a) to (c).
§63.7(e)(2)-(e)(9), (f), (g), and (h)	Performance Testing Requirements	Yes
§63.8(a) and (b)	Applicability and Conduct of Monitoring	Yes
§63.8(c)(1)	Operation and maintenance of CMS	Yes
§63.8(c)(1)(i)	General duty to minimize emissions and CMS operation	No. See §63.7500(a)(3).
§63.8(c)(1)(ii)	Operation and maintenance of CMS	Yes
§63.8(c)(1)(iii)	Startup, shutdown, and malfunction plans for CMS	No
§63.8(c)(2) to (c)(9)	Operation and maintenance of CMS	Yes
§63.8(d)(1) and (2)	Monitoring Requirements, Quality Control Program	Yes
§63.8(d)(3)	Written procedures for CMS	Yes, except for the last sentence, which refers to a startup, shutdown, and malfunction plan. Startup, shutdown, and malfunction plans are not required.
§63.8(e)	Performance evaluation of a CMS	Yes
§63.8(f)	Use of an alternative monitoring method.	Yes
§63.8(g)	Reduction of monitoring data	Yes
§63.9	Notification Requirements	Yes
§63.10(a), (b)(1)	Recordkeeping and Reporting Requirements	Yes
§63.10(b)(2)(i)	Recordkeeping of occurrence and duration of startups or shutdowns	Yes
§63.10(b)(2)(ii)	Recordkeeping of malfunctions	No. See §63.7555(d)(7) for recordkeeping of occurrence and duration and §63.7555(d)(8) for actions taken during malfunctions.
§63.10(b)(2)(iii)	Maintenance records	Yes
§63.10(b)(2)(iv) and (v)	Actions taken to minimize emissions during startup, shutdown, or malfunction	No
§63.10(b)(2)(vi)	Recordkeeping for CMS malfunctions	Yes
§63.10(b)(2)(vii) to (xiv)	Other CMS requirements	Yes

Citation	Subject	Applies to Subpart DDDDD
§63.10(b)(3)	Recordkeeping requirements for applicability determinations	No
§63.10(c)(1) to (9)	Recordkeeping for sources with CMS	Yes
§63.10(c)(10) and (11)	Recording nature and cause of malfunctions, and corrective actions	No. See §63.7555(d)(7) for recordkeeping of occurrence and duration and §63.7555(d)(8) for actions taken during malfunctions.
§63.10(c)(12) and (13)	Recordkeeping for sources with CMS	Yes
§63.10(c)(15)	Use of startup, shutdown, and malfunction plan	No
§63.10(d)(1) and (2)	General reporting requirements	Yes
§63.10(d)(3)	Reporting opacity or visible emission observation results	No
§63.10(d)(4)	Progress reports under an extension of compliance	Yes
§63.10(d)(5)	Startup, shutdown, and malfunction reports	No. See §63.7550(c)(11) for malfunction reporting requirements.
§63.10(e)	Additional reporting requirements for sources with CMS	Yes
§63.10(f)	Waiver of recordkeeping or reporting requirements	Yes
§63.11	Control Device Requirements	No
§63.12	State Authority and Delegation	Yes
§63.13-63.16	Addresses, Incorporation by Reference, Availability of Information, Performance Track Provisions	Yes
§63.1(a)(5),(a)(7)-(a)(9), (b)(2), (c)(3)-(4), (d), 63.6(b)(6), (c)(3), (c)(4), (d), (e)(2), (e)(3)(ii), (h)(3), (h)(5)(iv), 63.8(a)(3), 63.9(b)(3), (h)(4), 63.10(c)(2)-(4), (c)(9).	Reserved	No

3. Compliance Assurance Monitoring (CAM) Requirements

a. CAM Provisions

i. Proper Maintenance

Pursuant to 40 CFR 64.7(b), at all times, the source shall maintain the monitoring, including but not limited to, maintaining necessary parts for routine repairs of the monitoring equipment.

ii. Continued Operation

Pursuant to 40 CFR 64.7(c), except for, as applicable, monitoring malfunctions, associated repairs, and required quality assurance or control activities (including, as applicable, calibration checks and required zero and span adjustments), the source shall conduct all monitoring in continuous operation (or shall collect data at all required intervals) at all times that the pollutant-specific emissions unit (PSEU) is operating. Data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities shall not be used for purposes of 40 CFR Part 64, including data averages and calculations, or fulfilling a minimum data availability requirement, if applicable. The source shall use all the data collected during all other periods in assessing the operation of the control device and associated control system. A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not malfunctions.

iii. Response to Excursions or Exceedances

A. Pursuant to 40 CFR 64.7(d)(1), upon detecting an excursion or exceedance, the source shall restore operation of the PSEU (including the control device and associated capture system) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include minimizing the period of any startup, shutdown or malfunction and taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of an excursion or exceedance (other than those caused by excused startup or shutdown conditions). Such actions may include initial inspection and evaluation, recording that operations returned to normal without operator action (such as through response by a computerized distribution control system), or any necessary follow-up actions to return operation to within the indicator range, designated condition, or below the applicable emission limitation or standard, as applicable.

B. Pursuant to 40 CFR 64.7(d)(2), determination of whether the source has used acceptable procedures in response to an excursion or exceedance will be based on information available, which may include but is not limited to, monitoring results, review of operation and maintenance procedures and records, and inspection of the control device, associated capture system, and the process.

b. Monitoring - Monitoring

Pursuant to 40 CFR 64.7(a), the source shall comply with the monitoring requirements of the CAM Plans as described in 7.3(e) below, pursuant to 40 CFR Part 64 as submitted in the source's CAM plan application.

c. **Monitoring - Recordkeeping**

Pursuant to 40 CFR 64.9(b)(1), the source shall maintain records of the monitoring data, monitor performance data, corrective actions taken, monitoring equipment maintenance, and other supporting information related to the monitoring requirements established for CAM.

d. **Monitoring - Reporting**

Pursuant to Sections 39.5(7)(b) and (f) of the Act, the source shall submit the following reporting requirements:

i. Semiannual Reporting

As part of the required Semiannual Monitoring Reports, the source shall submit a CAM report including the following at a minimum:

A. Summary information on the number, duration, and cause of excursions or exceedances, and the corrective actions taken pursuant to 40 CFR 64.6(c)(3) and 64.9(a)(2)(i).

B. Summary information on the number, duration, and cause for monitoring equipment downtime incidents, other than downtime associated with zero and span or calibration checks pursuant to 40 CFR 64.6(c)(3) and 64.9(a)(2)(ii).

e. **CAM Plans**

The following tables contain the CAM Plans in this CAAPP permit:

Table	Emission Unit Section	PSEU Designation	Pollutant
7.3.1	4.1	WBI Sterilization Chamber	VOM
7.3.2	4.2	WBII Sterilization Chamber	VOM

Table 7.3.1 - CAM Plan

Emission Unit Section:	4.1
PSEU Designation:	WBI Sterilization Chamber
Pollutant:	VOM

Indicators:	#1) Recirculation Tank Level #1	#2) Recirculation Tank Level #2
General Criteria		
The Monitoring Approach Used to Measure the Indicators:	Measure height of tank level in Scrubber #1	Measure height of tank level in Scrubber #2
The Indicator Range Which Provides a Reasonable Assurance of Compliance:	<5200 gallons	< 159 inches
Quality Improvement Plan (QIP) Threshold Levels:	System will alarm and shutdown if tank level approaches 5200 gallons	System will alarm and shutdown if tank level approaches 159 inches
Performance Criteria		
The Specifications for Obtaining Representative Data:	Tank levels are taken visually by level gauge on tank.	Tank levels are taken visually by level gauge on tank.
Verification Procedures to Confirm the Operational Status of the Monitoring:	Trained technicians perform inspection.	Trained technicians perform inspection.
Quality Assurance and Quality Control (QA/QC) Practices that Ensure the Validity of the Data:	Routine preventative maintenance on control system.	Routine preventative maintenance on control system.
The Monitoring Frequency:	Tank level settings are controlled and monitored continuously.	Tank level settings are controlled and monitored continuously.
The Data Collection Procedures That Will Be Used:	Maintenance records	Maintenance records
The Data Averaging Period For Determining Whether an Excursion or Exceedance Has Occurred:	Weekly supervision of records	Weekly supervision of records

Table 7.3.2 - CAM Plan

Emission Unit Section:	4.2
PSEU Designation:	WBII Sterilization Chamber
Pollutant:	VOM

Indicators:	#1) Recirculation Tank Level	
General Criteria		
The Monitoring Approach Used to Measure the Indicators:	Measure height of tank level in Scrubber #1	
The Indicator Range Which Provides a Reasonable Assurance of Compliance:	<202 inches	
Quality Improvement Plan (QIP) Threshold Levels:	System will alarm and shutdown if tank level approaches 5200 gallons	
Performance Criteria		
The Specifications for Obtaining Representative Data:	Tank levels are taken visually by level gauge on tank.	
Verification Procedures to Confirm the Operational Status of the Monitoring:	Trained technicians perform inspection.	
Quality Assurance and Quality Control (QA/QC) Practices that Ensure the Validity of the Data:	Routine preventative maintenance on control system.	
The Monitoring Frequency:	Tank level settings are controlled and monitored continuously.	
The Data Collection Procedures That Will Be Used:	Maintenance records	
The Data Averaging Period For Determining Whether an Excursion or Exceedance Has Occurred:	Weekly supervision of records	

Section 8 - State Only Requirements

1. Permitted Emissions for Fees

The annual emissions from the source for purposes of "Duties to Pay Fees" of Condition 2.3(e), not considering insignificant activities as addressed by Section 6, shall not exceed the following limitations. The overall source emissions shall be determined by adding emissions from all emission units. Compliance with these limits shall be determined on a calendar year basis. The Permittee shall maintain records with supporting calculations of how the annual emissions for fee purposes were calculated. This Condition is set for the purpose of establishing fees and is not federally enforceable. See Section 39.5(18) of the Act.

Pollutant		*Tons/Year*
Volatile Organic Material	(VOM)	11.14
Sulfur Dioxide	(SO_2)	0.01
Particulate Matter	(PM)	0.22
Nitrogen Oxides	(NO_x)	3.00
HAP, not included in VOM or PM	(HAP)	0.00
	Total	14.37

Attachment 1 - List of Emission Units at This Source

Section	*Emission Units*	*Description*
4.1	Willowbrook I Sterilization Chambers	These are the units at Willowbrook I that house medical equipment that is sterilized with ethylene oxide.
4.2	Willowbrook II Sterilization Chambers	These are the units at Willowbrook II that house medical equipment that is sterilized with ethylene oxide.
4.3	Willowbrook I Aeration Rooms	These units allow the recently sterilized equipment to off-gas and are flushed with fresh air.
4.4	Willowbrook II Aeration Rooms	These units allow the recently sterilized equipment to off-gas and are flushed with fresh air.
4.5	Willowbrook I Boiler #1	The boiler provides process steam to the Willowbrook I facility.
4.6	Willowbrook II Boiler #1 and #2	The boiler provides process steam to the Willowbrook II facility.

Attachment 2 - Acronyms and Abbreviations

acfm	Actual cubic feet per minute
ACMA	Alternative Compliance Market Account
Act	Illinois Environmental Protection Act [415 ILCS 5/1 et seq.]
AP-42	Compilation of Air Pollutant Emission Factors, Volume 1, Stationary Point and Other Sources (and Supplements A through F), USEPA, Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711
ATU	Allotment trading unit
BACT	Best Available Control Technology
BAT	Best Available Technology
Btu	British Thermal Units
CAA	Clean Air Act [42 U.S.C. Section 7401 et seq.]
CAAPP	Clean Air Act Permit Program
CAIR	Clean Air Interstate Rule
CAM	Compliance Assurance Monitoring
CEMS	Continuous Emission Monitoring System
CFR	Code of Federal Regulations
CISWI	Commercial Industrial Solid Waste Incinerator
CO	Carbon monoxide
CO_2	Carbon dioxide
COMS	Continuous Opacity Monitoring System
CPMS	Continuous Parameter Monitoring System
dscf	Dry standard cubic foot
dscm	Dry standard cubic meter
ERMS	Emissions Reduction Market System
°F	Degrees Fahrenheit
GHG	Green house gas
GACT	Generally Acceptable Control Technology
gr	Grains
HAP	Hazardous air pollutant
Hg	Mercury
HMIWI	Hospital medical infectious waste incinerator
hp	Horsepower
hr	Hour
H_2S	Hydrogen sulfide
I.D. No.	Identification number of source, assigned by IEPA
IAC	Illinois Administrative Code
ILCS	Illinois Compiled Statutes
IEPA	Illinois Environmental Protection Agency
kw	Kilowatts
LAER	Lowest Achievable Emission Rate
lbs	Pound

m	Meter
MACT	Maximum Achievable Control Technology
M	Thousand
MM	Million
mos	Month
MSDS	Material Safety Data Sheet
MSSCAM	Major Stationary Sources Construction and Modification (Non-attainment New Source Review)
MW	Megawatts
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_x	Nitrogen oxides
NSPS	New Source Performance Standards
NSR	New Source Review
PB	Lead
PEMS	Predictive Emissions Monitoring System
PM	Particulate matter
PM_{10}	Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 microns as measured by applicable test or monitoring methods
$PM_{2.5}$	Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 microns as measured by applicable test or monitoring methods
ppm	Parts per million
ppmv	Parts per million by volume
ppmw	Parts per million by weight
PSD	Prevention of Significant Deterioration
PSEU	Pollutant-Specific Emission Unit
psia	Pounds per square inch absolute
PTE	Potential to emit
RACT	Reasonable Available Control Technology
RMP	Risk Management Plan
scf	Standard cubic feet
SCR	Selective catalytic reduction
SIP	State Implementation Plan
SO_2	Sulfur dioxide
T1	Title I - identifies Title I conditions that have been carried over from an existing permit
T1N	Title I New - identifies Title I conditions that are being established in this permit
T1R	Title I Revised - identifies Title I conditions that have been carried over from an existing permit and subsequently revised in this permit
USEPA	United States Environmental Protection Agency
VOM	Volatile organic material

Attachment 3 - Contact and Reporting Addresses

IEPA Compliance Section	Illinois EPA, Bureau of Air Compliance & Enforcement Section (MC 40) 1021 North Grand Avenue East P.O. Box 19276 Springfield, Illinois 62794-9276 Phone No.: 217/782-2113
IEPA Stack Test Specialist	Illinois EPA, Bureau of Air Compliance Section Source Monitoring - Third Floor 9511 Harrison Street Des Plaines, Illinois 60016 Phone No.: 847/294-4000
IEPA Air Quality Planning Section	Illinois EPA, Bureau of Air Air Quality Planning Section (MC 39) 1021 North Grand Avenue East P.O. Box 19276 Springfield, Illinois 62794-9276 Phone No.: 217/782-2113
IEPA Air Regional Field Operations Regional Office #1	Illinois EPA, Bureau of Air Regional Office #1 9511 Harrison Street Des Plaines, Illinois 60016 Phone No.: 847/294-4000
IEPA Permit Section	Illinois EPA, Bureau of Air Permit Section (MC 11) 1021 North Grand Avenue East P.O. Box 19506 Springfield, Illinois 62794-9506 Phone No.: 217/785-1705
USEPA Region 5 - Air Branch	USEPA (AR - 17J) Air and Radiation Division 77 West Jackson Boulevard Chicago, Illinois 60604 Phone No.: 312/353-2000

Attachment 4 - Example Certification by a Responsible Official

SIGNATURE BLOCK	
NOTE: THIS CERTIFICATION MUST BE SIGNED BY A RESPONSIBLE OFFICIAL. APPLICATIONS WITHOUT A SIGNED CERTIFICATION WILL BE DEEMED AS INCOMPLETE.	
I CERTIFY UNDER PENALTY OF LAW THAT, BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION CONTAINED IN THIS APPLICATION ARE TRUE, ACCURATE AND COMPLETE. ANY PERSON WHO KNOWINGLY MAKES A FALSE, FICTITIOUS, OR FRAUDULENT MATERIAL STATEMENT, ORALLY OR IN WRITING, TO THE ILLINOIS EPA COMMITS A CLASS 4 FELONY. A SECOND OR SUBSEQUENT OFFENSE AFTER CONVICTION IS A CLASS 3 FELONY. (415 ILCS 5/44(H))	
AUTHORIZED SIGNATURE:	
BY: _____	_____
AUTHORIZED SIGNATURE	TITLE OF SIGNATORY
_____	_____ / _____ / _____
TYPED OR PRINTED NAME OF SIGNATORY	DATE

Message

From: Rountree, Jillian [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7D304E5E55A54908B24B17E57ECDBF3C-JROUNTRE]
Sent: 8/31/2018 9:00:59 PM
To: Cohen, Eric [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=545800040a904d3e9ccfa22400b0f5fa-Eocohen]
Subject: FW: Willowbrook asks Sterigenics to cease operations
Attachments: Letter requesting Sterigenics cease operations.pdf

FYI

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5
312-353-3849
Some of my email messages and attachments contain information that is privileged, confidential, or prohibited from disclosure under applicable law. If you believe you may have received this message in error, please inform the sender immediately. Further, do not read, print, or distribute any messages or attachments received in error. Immediately delete and otherwise destroy any such messages and attachments. Thank you.

From: Nam, Ed
Sent: Friday, August 31, 2018 3:58 PM
To: Siegel, Kathryn ; Rountree, Jillian ; Furey, Eileen ; Cain, Alexis
Subject: FW: Willowbrook asks Sterigenics to cease operations

FYI

From: Kelley, Jeff
Sent: Friday, August 31, 2018 3:42 PM
To: Stepp, Cathy <stepp.cathy@epa.gov>; Thiede, Kurt <thiede.kurt@epa.gov>; Payne, James <payne.james@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Johnson, Mark <johnson.mark@epa.gov>; Singer, Joshua <Singer.Joshua@epa.gov>
Subject: Willowbrook asks Sterigenics to cease operations

http://www.willowbrookil.org/CivicAlerts.aspx?AID=372

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

Message

From: Rountree, Jillian [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7D304E5E55A54908B24B17E57ECDBF3C-JROUNTRE]
Sent: 8/30/2018 5:22:39 PM
To: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Furey, Eileen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5aaa3a0ee58047d983897c53c1eb283e-EFurey]
Subject: RE: Today's Presentation

Thank you Katie!

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5
312-353-3849
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From: Siegel, Kathryn
Sent: Thursday, August 30, 2018 12:07 PM
To: Rountree, Jillian ; Furey, Eileen
Subject: FW: Today's Presentation

FYI

Sterigenics clarified that this is not confidential

From: Hoffman, Kathy [mailto:KHoffman@sterigenics.com]
Sent: Wednesday, July 18, 2018 6:42 PM
To: Cain, Alexis <cain.alexis@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Nguyen, Phuong <Nguyen.Phuong@epa.gov>; King, Steven <Steven.King@Illinois.gov>; Mattison, Kevin <Kevin.Mattison@Illinois.gov>; Ogulei, David <Ogulei.David@epa.gov>
Subject: Today's Presentation

It was nice meeting with all of you today at our Willowbrook facility. As promised during today's meeting, attached is my presentation. I hope this discussion and tour was helpful in better understanding our EO sterilization process and emissions. I look forward to continuing to work with you on this issue.

Let me know if you have any further questions.

Regards,
Kathy

Kathleen Hoffman
Senior Vice President - Global Environmental, Health & Safety and Technical Services
Sterigenics, A Sotera Health Company
2015 Spring Road, Suite 650
Oak Brook, IL 60523
Office: 630.928.1758
khoffman@sterigenics.com

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Message

From: Rountree, Jillian [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7D304E5E55A54908B24B17E57ECDBF3C-JROUNTRE]
Sent: 8/28/2018 9:10:08 PM
To: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
CC: Furey, Eileen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5aaa3a0ee58047d983897c53c1eb283e-EFurey]
Subject: RE: EPA attendees for Willowbrook meeting

And FYI: http://www.chicagotribune.com/news/sns-bc-il--dupage-county-cancer-risk-20180828-story.html

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5
312-353-3849

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From: Rountree, Jillian
Sent: Tuesday, August 28, 2018 4:08 PM
To: Kathryn Siegel (siegel.kathryn@epa.gov)
Cc: Eileen Furey (furey.eileen@epa.gov)
Subject: FW: EPA attendees for Willowbrook meeting

Attorney Client / Ex. 5

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5
312-353-3849

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From: Siegel, Kathryn
Sent: Tuesday, August 28, 2018 2:54 PM
To: Rountree, Jillian <Rountree.Jillian@epa.gov>
Subject: RE: EPA attendees for Willowbrook meeting

Stop by whenever you're ready. Thanks!

From: Rountree, Jillian
Sent: Tuesday, August 28, 2018 2:42 PM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: RE: EPA attendees for Willowbrook meeting

Thanks Katie. Let me know when you want me to come by.

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5
312-353-3849
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From: Siegel, Kathryn
Sent: Tuesday, August 28, 2018 2:01 PM
To: Nam, Ed <nam.ed@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Cc: Rountree, Jillian <Rountree.Jillian@epa.gov>
Subject: RE: EPA attendees for Willowbrook meeting

Jill and I would like to attend.

P.S. Just texted you an update from Mark.

From: Nam, Ed
Sent: Tuesday, August 28, 2018 1:59 PM
To: Furey, Eileen <furey.eileen@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: Fwd: EPA attendees for Willowbrook meeting

Sent from my iPhone

Begin forwarded message:

From: "Kelley, Jeff" <kelley.jeff@epa.gov>
Date: August 28, 2018 at 1:44:13 PM CDT
To: "Stepp, Cathy" <stepp.cathy@epa.gov>, "Nam, Ed" <nam.ed@epa.gov>, "Thiede, Kurt" <thiede.kurt@epa.gov>
Subject: EPA attendees for Willowbrook meeting

Any additions/subtractions before I send to Lissa?

- Regional Administrator Cathy Stepp

- Ed Nam, director, Air & Radiation Division
- Jeff Kelley, director, Office of External Communications
- Rachel Bassler, Office of External Communications

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

Message

From: Rountree, Jillian [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7D304E5E55A54908B24B17E57ECDBF3C-JROUNTRE]
Sent: 10/2/2018 8:51:34 PM
To: Eileen Furey (furey.eileen@epa.gov) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5aaa3a0ee58047d983897c53c1eb283e-EFurey]
Subject: FW: Sterigenics letter
Attachments: STERIGENICS - NAM LETTER_09-17-2018_11-14-01.pdf

This is the letter I was thinking of. Let me know if you need me to look for something else.

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5
312-353-3849
Some of my email messages and attachments contain information that is privileged, confidential, or prohibited from disclosure under applicable law. If you believe you may have received this message in error, please inform the sender immediately. Further, do not read, print, or distribute any messages or attachments received in error. Immediately delete and otherwise destroy any such messages and attachments. Thank you.

From: Wallace, Elizabeth [mailto:EWallace@atg.state.il.us]
Sent: Monday, September 17, 2018 11:46 AM
To: Cohen, Eric <cohen.eric@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>
Subject: FW: Sterigenics letter

Hi. Just wanted to make sure you saw this too. Beth

From: Wallace, Elizabeth
Sent: Monday, September 17, 2018 11:38 AM
To: Nam, Ed <nam.ed@epa.gov>
Cc: Payne, James <payne.james@epa.gov>; 'Nelson, Leverett' <nelson.leverett@epa.gov>; John.J.kim@illinois.gov; lisa.smith@dupageco.org; Dunn, Matthew <MDunn@atg.state.il.us>
Subject: Sterigenics letter

Good morning,

Please see the attached letter. If you have questions or wish to discuss further, Matt Dunn's direct line is (217) 524-5511, and my direct line is below.

Thank you for your assistance and we look forward to continuing to work with you on this matter.

Best regards,

Beth

Elizabeth Wallace, Chief
Environmental Bureau / Chicago
Office of the Illinois Attorney General
69 W. Washington St., 18th Flr.
Chicago, IL 60602
(312)814-5396
(312)814-2347 (fax)
ewallace@atg.state.il.us

Message

From: Rountree, Jillian [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7D304E5E55A54908B24B17E57ECDBF3C-JROUNTRE]
Sent: 9/27/2018 6:14:53 PM
To: Kathryn Siegel (siegel.kathryn@epa.gov) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]; Alexis Cain (cain.alexis@epa.gov) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0249d52afe7a491ea6859bf276e694e9-ACain]; Margaret Sieffert (Sieffert.Margaret@epa.gov) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dbb22fa4a9b14c1e8c634b2e0791cefa-MSieffer]
Subject: ICYMI

https://insideepa.com/daily-news/acc-asks-epa-correct-ethylene-oxide-risk-level-after-chloroprene-deal

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5
77 W. Jackson Blvd. (C-14J), Cube 18010
Chicago, Illinois 60604
312-353-3849
rountree.jillian@epa.gov

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Message

From: Rountree, Jillian [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7D304E5E55A54908B24B17E57ECDBF3C-JROUNTRE]
Sent: 9/20/2018 1:16:48 PM
To: Siegel, Kathryn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f57a52efead9497cb582b11b8c85f09f-KSiege02]
Subject: RE: Sterigenics Concerns

Hey Katie,

Attorney Client and Deliberative Process / Ex. 5 Thanks!

Jill

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5
312-353-3849
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From: Nam, Ed
Sent: Thursday, September 20, 2018 6:49 AM
To: Siegel, Kathryn <siegel.kathryn@epa.gov>; Rountree, Jillian <Rountree.Jillian@epa.gov>
Subject: Fwd: Sterigenics Concerns

Jill

Attorney Client and Deliberative Process / Ex. 5

Sent from my iPhone

Begin forwarded message:

From: Citizen Name / Ex. 6 Personal Email / Ex. 6
Date: September 19, 2018 at 10:53:06 PM CDT
To: step.cathy@epa.gov, nam.ed@epa.gov
Subject: Fwd: Sterigenics Concerns

Hello i am a resident of Burr Ridge and very concerned about Sterigenics and the lack of action to shut down this company. Noone is sure if there are long term effects or even if the emissions now are safe.. Also what is they have an accident or there filtering breaks how do we know? Do we just get sick or exposed. How can such a dangerous facility with no definitive research be allowed to be within my childs schools and park?

What can you do to shut this firm down.. This is sounding like a disaster and huge scandal that noone in Illinois is taking action on or protecting its citizens.. FLINT 2.0 or worse.. Willowbrook is the most cancerous region second only to cancer alley.. how is that possible or a coincidence..?

thanks, awaiting your reply

Citizen Name / Ex. 6

Appointment

From: Siegel, Kathryn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F57A52EFEAD9497CB582B11B8C85F09F-KSIEGE02]
Sent: 8/14/2018 6:52:40 PM
To: Rountree, Jillian [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7d304e5e55a54908b24b17e57ecdbf3c-JRountre]

Subject: FW: Rollout of Sterigenics data - Willowbrook
Location: R5Metcalfe-ConfRm-R1813A/R5-Metcalfe---18th-Floor

Start: 8/15/2018 7:00:00 PM
End: 8/15/2018 8:00:00 PM
Show Time As: Tentative

-----Original Appointment-----
From: Nam, Ed
Sent: Monday, August 13, 2018 4:46 PM
To: Nam, Ed; Glover, John; Durno, Mark; Newton, Cheryl; Short, Thomas; Siegel, Kathryn; Cain, Alexis; Furey, Eileen; Payne, James; Kelley, Jeff; Thiede, Kurt; Singer, Joshua; Johnson, Mark; Colledge, Michelle; Doug Ballotti (ballotti.douglas@epa.gov)
Cc: Bollweg, George; Borries, Samuel
Subject: Rollout of Sterigenics data - Willowbrook
When: Wednesday, August 15, 2018 2:00 PM-3:00 PM (UTC-06:00) Central Time (US & Canada).
Where: R5Metcalfe-ConfRm-R1813A/R5-Metcalfe---18th-Floor

Hello,

I apologize for the short notice. We need to meet to discuss communication strategy with Willowbrook employees with the Sterigenics/Ethylene Oxide data release imminent.
We also need to discuss the communication of the results recently concluded by John Glover.
Not all of you are required at this meeting. You can delegate if you like.

Thanks,
-Ed

Message

Sent: 10/2/2018 10:41:39 PM
To: Furey, Eileen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5aaa3a0ee58047d983897c53c1eb283e-EFurey]
Subject: RE: IEPA Press Release issued today: Illinois EPA Refers Sterigenics to Attorney General for Enforcement

Attorney Client and Deliberative Process / Ex. 5

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5
312-353-3849
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From: Furey, Eileen
Sent: Tuesday, October 2, 2018 5:38 PM
To: Rountree, Jillian <Rountree.Jillian@epa.gov>
Subject: RE: IEPA Press Release issued today: Illinois EPA Refers Sterigenics to Attorney General for Enforcement

Attorney Client and Deliberative Process / Ex. 5

Eileen L. Furey
Deputy Director
Air and Radiation Division
U.S. EPA Region 5
(312) 886-7950

From: Rountree, Jillian
Sent: Tuesday, October 02, 2018 5:35 PM
To: Furey, Eileen <furey.eileen@epa.gov>
Subject: RE: IEPA Press Release issued today: Illinois EPA Refers Sterigenics to Attorney General for Enforcement

Attorney Client and Deliberative Process / Ex. 5

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5
312-353-3849
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From: Furey, Eileen
Sent: Tuesday, October 2, 2018 5:31 PM
To: Rountree, Jillian <Rountree.Jillian@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>
Subject: RE: IEPA Press Release issued today: Illinois EPA Refers Sterigenics to Attorney General for Enforcement

Attorney Client and Deliberative Process / Ex. 5

Thanks,
Eileen

Eileen L. Furey
Deputy Director
Air and Radiation Division
U.S. EPA Region 5
(312) 886-7950

From: Rountree, Jillian
Sent: Tuesday, October 02, 2018 3:48 PM
To: Nam, Ed <nam.ed@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Subject: RE: IEPA Press Release issued today: Illinois EPA Refers Sterigenics to Attorney General for Enforcement

Attorney Client and Deliberative Process / Ex. 5

ATTORNEY CLIENT PRIVILEGED; ENFORCEMENT CONFIDENTIAL; DELIBERATIVE

Jillian Rountree
Air and Radiation Division Detail Attorney
U.S. EPA Region 5
77 W. Jackson Blvd. (C-14J), Cube 18010
Chicago, Illinois 60604
312-353-3849
rountree.jillian@epa.gov

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From: Nam, Ed
Sent: Tuesday, October 2, 2018 2:15 PM
To: Cain, Alexis <cain.alexis@epa.gov>
Cc: Rountree, Jillian <Rountree.Jillian@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Subject: RE: IEPA Press Release issued today: Illinois EPA Refers Sterigenics to Attorney General for Enforcement

Attorney Client and Deliberative Process / Ex. 5

Attorney Client / Ex. 5

From: Cain, Alexis
Sent: Tuesday, October 02, 2018 1:59 PM
To: Smith, Darcie <Smith.Darcie@epa.gov>; Rimer, Kelly <Rimer.Kelly@epa.gov>
Cc: Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>
Subject: FW: IEPA Press Release issued today: Illinois EPA Refers Sterigenics to Attorney General for Enforcement

Deliberative Process / Ex. 5 llinois is saying that Sterigenics should shut down "until a complete review of additional modeling and risk assessment is completed by U.S. EPA or until U.S. EPA otherwise assures the community that resumed operations would not present an elevated health risk."

Alexis Cain
USEPA-Region 5
(312) 886-7018
cain.alexis@epa.gov

From: Singer, Joshua
Sent: Tuesday, October 02, 2018 1:55 PM
To: Kelley, Jeff <kelley.jeff@epa.gov>; Rowan, Anne <rowan.anne@epa.gov>; Nam, Ed <nam.ed@epa.gov>; Siegel, Kathryn <siegel.kathryn@epa.gov>; Furey, Eileen <furey.eileen@epa.gov>; Cain, Alexis <cain.alexis@epa.gov>; Sieffert, Margaret <Sieffert.Margaret@epa.gov>
Cc: Deamer, Eileen <deamer.eileen@epa.gov>
Subject: IEPA Press Release issued today: Illinois EPA Refers Sterigenics to Attorney General for Enforcement

http://www.willowbrookil.org/DocumentCenter/View/1450

Message

From: Stepp, Cathy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BEFDAFC0FA1A425EAE232F60AD9BDA1D-STEPP, CATH]
Sent: 9/5/2018 2:16:13 AM
To: Frank Personal Email / Ex. 6
Subject: Re: Sterigenics

Mayor, thanks for letting me know. Would u be willing to give me a call to discuss? Sometime between 12-1 tomorrow?

Cathy

Sent from my iPhone

> On Sep 4, 2018, at 4:38 PM, Frank <kingwash@aol.com> wrote:
>
> Sterigenics has pushed tested to this weekend in an effort to get fast info- hoping the EPA can be there to assist-our community needs it's fed gov the Stepp Up!
> Thanks in advance for your consideration
> Mayor Trilla
>
> Sent from my iPhone

Message

From: Stepp, Cathy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BEFDAFC0FA1A425EAE232F60AD9BDA1D-STEPP, CATH]
Sent: 6/21/2018 2:13:49 PM
To: Thiede, Kurt [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3cc09fac5acc4ce1ba689fb2ce70d459-Thiede, Kur]
Subject: Re: Sterigenics news release

Ok

Sent from my iPhone

On Jun 21, 2018, at 9:13 AM, Thiede, Kurt <thiede.kurt@epa.gov> wrote:

> Agreed…Will do once we have concurrence from NG
>
> **From:** Stepp, Cathy
> **Sent:** Thursday, June 21, 2018 9:10 AM
> **To:** Thiede, Kurt <thiede.kurt@epa.gov>
> **Subject:** Re: Sterigenics news release
>
> Let's share this with Alec's shop if we haven't already done so.
>
> Sent from my iPhone
>
> On Jun 21, 2018, at 8:58 AM, Thiede, Kurt <thiede.kurt@epa.gov> wrote:
>
>> This is the draft final…let me know if you are ok.
>>
>> As you can see below…sounds like there will be an additional call with HQ today.
>>
>> Kurt
>>
>> **From:** Kelley, Jeff
>> **Sent:** Thursday, June 21, 2018 8:46 AM
>> **To:** Thiede, Kurt <thiede.kurt@epa.gov>
>> **Subject:** Sterigenics news release
>>
>> *I think this version incorporates your comments and those from ARD. Nancy would like to see a draft once you're comfortable with it. She's also suggesting some kind of high-level coordination call today … I can fill you in.*
>>
>> **DRAFT // EPA FINDS HIGH LEVELS OF CANCER-CAUSING POLLUTANT IN WILLOWBROOK, ILL.**

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

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Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

Message

From: Stepp, Cathy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BEFDAFC0FA1A425EAE232F60AD9BDA1D-STEPP, CATH]
Sent: 6/21/2018 2:08:17 PM
To: Thiede, Kurt [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3cc09fac5acc4ce1ba689fb2ce70d459-Thiede, Kur]
Subject: Re: Sterigenics news release

Looks good

Sent from my iPhone

On Jun 21, 2018, at 8:58 AM, Thiede, Kurt <thiede.kurt@epa.gov> wrote:

This is the draft final…let me know if you are ok.

As you can see below…sounds like there will be an additional call with HQ today.

Kurt

From: Kelley, Jeff
Sent: Thursday, June 21, 2018 8:46 AM
To: Thiede, Kurt <thiede.kurt@epa.gov>
Subject: Sterigenics news release

I think this version incorporates your comments and those from ARD. Nancy would like to see a draft once you're comfortable with it. She's also suggesting some kind of high-level coordination call today … I can fill you in.

DRAFT // EPA FINDS HIGH LEVELS OF CANCER-CAUSING POLLUTANT IN WILLOWBROOK, ILL.

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

###

Jeff Kelley
Director, Office of External Communications
U.S. EPA Region 5
ph: 312-353-1159

Message

From: Stepp, Cathy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BEFDAFC0FA1A425EAE232F60AD9BDA1D-STEPP, CATH]
Sent: 7/18/2018 6:08:16 PM
To: Thiede, Kurt [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3cc09fac5acc4ce1ba689fb2ce70d459-Thiede, Kur]
Subject: Re: Ethylene Oxide

Thanks Kurt. I really appreciate u keeping the pressure on and comm lines open with HQ.

The sooner we can lead on this the better. I appreciate your follow up.

Cathy Stepp
Region 5 Administrator, EPA
Chicago, IL

Sent from my iPhone

On Jul 18, 2018, at 11:57 AM, Thiede, Kurt <thiede.kurt@epa.gov> wrote:

> Cathy,
>
> What follows is a summary of today's call hosted by Bill Wehrum regarding Ethylene Oxide. For us this has specific importance given the three facilities we have here in Region 5. Most notably Sterigenics in Chicago.

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Cathy, thanks to your leadership we are ready with our communication plan, we are actively working on a remedy in R5 along with IEPA.

Kurt

Sent from my iPad

Message

From: Stepp, Cathy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BEFDAFC0FA1A425EAE232F60AD9BDA1D-STEPP, CATH]
Sent: 10/4/2018 6:43:04 PM
To: Thiede, Kurt [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3cc09fac5acc4ce1ba689fb2ce70d459-Thiede, Kur]
Subject: Fwd: Willowbrook Briefing Paper
Attachments: Eto and WIllowbrook.Draft briefing paper for Administrator. 10.3.18 r5 edits 10.4.docx; ATT00001.htm

Deliberative Process / Ex. 5 Thanks

Sent from my iPhone

Begin forwarded message:

From: "Deamer, Eileen" <deamer.eileen@epa.gov>
Date: October 4, 2018 at 2:36:42 PM EDT
To: "Stepp, Cathy" <stepp.cathy@epa.gov>, "Thiede, Kurt" <thiede.kurt@epa.gov>
Cc: "Kelley, Jeff" <kelley.jeff@epa.gov>
Subject: Willowbrook Briefing Paper

Cathy and Kurt –

Please find attached a briefing paper for Acting Administrator Wheeler on Sterigenics and Eto

Deliberative Process / Ex. 5

Please let me know when I can forward it.

Thanks,

Eileen Deamer
U.S. EPA Region 5
Congressional and Intergovernmental
(312) 886-1728