VIII. Vapor Balancing

A. Vapor Balancing is Widely Used in This Source Category

As **Table 8** indicates, vapor balancing is used widely throughout the industry to load storage vessels and unload transportation vehicles (*e.g.*, railcar). Indeed, it is virtually impossible to unload a vinyl chloride railcar without any HAP emissions without using vapor balancing. When unloading a vinyl chloride railcar, there are two options for loading a storage vessel: (1) use vinyl chloride pressure to push vinyl chloride into the storage sphere and vapor balance the sphere back to the railcar; or (2) use nitrogen pressure to push vinyl chloride to the storage sphere and send the vapors to the control device. The second option results in low-level HAP emissions through the control device. In contrast, when using vapor balancing, vapors from the railcar, the sphere, and the lines are recovered, thus ensuring there are no HAP emissions from the process. Accordingly, the Working Group submits that EPA should reconsider and expressly allow the ongoing use of vapor balancing at PVC facilities.

Table 8: PVC Industry Use of Vapor Balancing

Facility	Reported Practice of Vapor Balancing
Dow Midland	Yes
Formosa Baton Rouge	Yes
Formosa Delaware	Yes
Formosa Point Comfort	Yes
Formosa SPVC	No
OxyVinyls Deer Park	No
OxyVinyls Pasadena	No
OxyVinyls Pedricktown	No
PolyOne Henry	No
PolyOne Pedricktown	No
Shintech Addis	Yes
Shintech Freeport	Yes
Shintech Plaquemine	Yes
Westlake Calvert City	Yes
Westlake Geismar	Yes
Georgia Gulf Aberdeen	Yes
Georgia Gulf Plaquemine	Yes

B. Vapor Balancing is a Proven Control Technology

As the industry noted in its comments, vapor balancing is a proven control technology that EPA has allowed as a control option for storage tanks in many other MACT rules, including the Agency's recently proposed Uniform Standards.[105] Although vapor balancing is not addressed in the final PVC MACT rule, the Working Group submits that vapor balancing is not prohibited by the final rule, particularly as no emissions are released from the practice. Nevertheless, both industry and the Agency would benefit from a common and consistent understanding of the practice through explicit regulatory recognition. In addition, its widespread use throughout the industry would make compliance and enforcement of vapor balancing as a Section 6.36(g) alternative means of emission limitation impracticable, further elevating the need for correction on reconsideration.

[105] Docket Document No. EPA-HQ-OAR-2002-0037-0146, at 87.

C. Vapor Balancing Should be Explicitly Recognized in the Rule

In their comments, Working Group members requested that EPA allow vapor balancing as a means of controlling emissions from storage vessels. The final PVC MACT rule is silent on the issue, and according to EPA, it did not have data on the appropriateness of using vapor balancing on storage vessels in the PVC source category.[106] A Working Group member raised this issue with the Agency at their April 18, 2012 meeting, and reminded the EPA staff that vapor balancing is a widespread activity throughout the industry. Under the circumstances of a widely used and proven control technology that is fundamental to avoiding emissions during normal operations, such as railcar loading, it would be arbitrary and capricious for the Agency not to exercise its discretion, grant reconsideration, and add a provision in the PVC MACT that explicitly allows vapor balancing.

IX. Requirements for Combined Process Vents Must be Reconsidered

Several PVC production facilities share process vent and other control devices with facilities in other source categories, including facilities that are in the ethylene dichloride and/or vinyl chloride ("EDC/VCM") production industry or subject to the Hazardous Organic NESHAP ("HON") or Miscellaneous Organic NESHAP ("MON"). During the development of the PVC MACT, several EDC/VCM manufacturers, many of which also are subject to the PVC MACT, received a Section 114 Request from EPA for survey and test data to support the development of an EDC/VCM MACT rule. Given this ongoing and clearly overlapping initiative, the Working Group urged EPA to postpone development of the PVC MACT in favor of a consolidated rule covering PVC, EDC, and VCM facilities, or two rules that are consistent. In separately filed comments, a Working Group member maintained that EPA should allow compliance with the MON/HON if greater than 50 percent of the HAP flow is from a MON/HON-regulated facility. Another Working Group member recommended that EPA set process vent limits for combined flow control devices based on weighted average flow volumes.

A. It was Not Feasible to Comment on the New Data on Which EPA Based the Final Rule Requirements for Combined Process Vents

In the proposed PVC MACT rule, EPA did not differentiate between PVC-only and PVC-combined process vents in setting emission limits. In the final rule, however, EPA promulgated separate emission limits for PVC-only process vents and PVC-combined process vents. The emission limits for combined process vents were a surprise to the PVC industry because the limits are based on EDC/VCM data developed for purposes of the EDC/VCM Section 114 Request and rulemaking. Indeed, EDC/VCM sampling was not completed until well after the close of the PVC MACT comment period, and the data was not placed in the docket until January 25, 2012, less than three weeks before the Administrator signed the final PVC MACT rule. Accordingly, it was impracticable for the Working Group to review and comment upon EPA's treatment of the EDC/VCM data before publication of the final PVC MACT rule.

[106] Docket Document No. EPA-HQ-OAR-2002-0037-0185, at 12-65.

B. The Applicable Scope of the Combined Process Vent Provision Merits Reconsideration Based on the Conflict Between the Preamble Explanation and the Language of the Final Rule

As the D.C. Circuit noted in *Portland Cement Association v. EPA*,[107] the Agency has an obligation to "acknowledge and account for a changed regulatory posture the agency creates—especially when the change impacts a contemporaneous and closely related rulemaking."[108] Notwithstanding the clear basis for mandatory reconsideration of the combined process vent emissions limitations, the Working Group's concern here is focused on the applicability of the combined process vent limitation to facilities outside the PVC source category. Specifically, Section 63.11865 of the rule expressly states that the PVC MACT does not apply to chemical manufacturing process units that produce VCM or other raw materials used to produce PVC. In contrast, the preamble to the final PVC MACT indicates that facilities in a different source category handling vent streams from multiple facilities must comply with all rules applicable to their common control device, whether it is the HON, the PVC MACT, or another rule. According to the Agency:

> *If an emission point is subject to both the PVC NESHAP and other NESHAP because emissions from two source categories are vented to the same control device, both standards apply. Multiple standards applicable to one emission point for the same pollutant are not necessarily "conflicting" or "inconsistent." In some standards, the EPA has allowed compliance with another overlapping standard where that other overlapping standard was determined to be at least as stringent...If the EPA were to allow sources to meet the requirements from overlapping, but potentially less stringent rules in lieu of the PVC standards, there is the possibility that PVC facilities would not meet the MACT floor based standards in this rule. Although we recognize that facilities may be subject to different NESHAP regulations, sources are responsible for ensuring that they comply with all applicable regulations. Many NESHAP regulations provide a wide variety of compliance options, and, as such, it would be a difficult task to identify in advance which is the most stringent requirement in each case.*[109]

When Working Group members met with EPA on April 18, 2012, to discuss the final rule, one critical question raised was the impact of the combined process vent limit on EDC/VCM and other HON or MON units that may share a control device with a PVC unit. The staff repeatedly stressed that the most stringent limit would apply, but it was not clear whether the staff's focus was only on the PVC side of the equation or whether they intended also for the HON/MON units to comply with the new PVC MACT limits. This is a critical issue as HON/MON units currently are not subject to some of the more stringent limits in the PVC MACT and HON/MON unit operators were not afforded the opportunity to comment on whether their control devices could meet the process vent and related operating requirements finalized in the PVC MACT for combined flow.

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[107] *Portland Cement Ass'n*, 665 F.3d at 187 (D.C. Cir. 2011).

[108] *Id.*

[109] 77 Fed. Reg. 22,869.

It is not a simple matter to parse out "the most stringent" operating requirements between different units with different operating conditions and different rule requirements. Two examples illustrate how a shared MACT-affected control device is now subject to new requirements for which the affected sources with "process vents originating from another source category" did not have an opportunity to review, comment, and resolve the discrepancies and conflicts:

1. At 40 C.F.R. § 63.11940(c)(2), the final PVC MACT requires that the following be installed on required HCl scrubbers: pressure gauges; a temperature monitoring device at the scrubber gas stream exit; or a specific gravity device. HON does not require any other monitoring devices (*see* 40 C.F.R. § 63.114(a)(4)), nor is it clear that this equipment would be appropriate for control devices generally regulated under the HON or MON.

2. Taking PVC MACT's Table 1 and 2 emission limits for Dioxin/Furans ("D/F") as an example, Section 63.11925(c)(2) for the final PVC MACT requires affected sources to establish an operating limit as per Section 63.11880(b). PVC-combined process vent affected sources must now determine how to comply with this requirement for the affected source's PVC operations, along with the process vents from the other source category (*e.g.*, HON or MON), which do not have D/F limits.

If EPA intended for the HON/MON units to comply with the new PVC MACT limits, then EPA has erred and violated the admonishment of the *Portland Cement* court that "it would certainly be arbitrary, as well as a violation of the CAA itself, for EPA to set one standard based on data already placed in another source category in light of the mutual exclusivity of the standards themselves,"[110] particularly as none of the facilities in the EDC/VCM source category have had an opportunity to comment on these limits and the new potentially applicable operating requirements. Even if the Agency's approach is permissible, the rule is silent, and the staff has not addressed to what extent, if any, the most stringent standard extends back to all source operations (*e.g.*, emission profiles at the process equipment) up to and including operating parameters for the control device as well as emission limits for the vent discharging to the atmosphere. Nor has EPA resolved any conflicting provisions.

For these reasons, the final rule should be amended or clarified consistent with the express language in Section 63.11865.

X. The New Requirements for Emission Profiles are Overbroad and Must be Reconsidered

Pursuant to Section 63.11925(g) of the final rule, which was not in the proposed rule, PVC facilities must now "characterize each process vent by developing an emissions profile for each contributing continuous process vent, miscellaneous vent and batch process vent," as part of their initial and continuous compliance demonstrations.[111] The emission profile is intended to

[110] *Portland Cement Ass'n*, 665 F.3d at 186.

[111] 77 Fed. Reg. 22,915 (codfied at 40 C.F.R. § 63.11925(g)).

describe the characteristics of the process vent stream under either absolute or hypothetical worst-case conditions so facilities can demonstrate that "process vent streams are serving a valid process purpose and are not being diluted prior to control."[112] This new requirement is in addition to the requirement at Section 63.11945 that an emission profile must be used to demonstrate that the maximum load is sent to the control device for initial and periodic compliance testing.

The Agency's changes to the definitions of process vent, batch process vent, and continuous process vent, as well as the addition of a new miscellaneous vent category after the close of the comment period, expanded the emission profile requirement to cover vents not addressed by the proposed rule. The emission profile requirement under the proposed rule applied only to batch process vents and was limited to establishing stack testing "worst case conditions."[113] The final rule not only expands the emission profile requirement, but does so in a manner that is unnecessary and overly burdensome to the PVC industry.

In other words, the proposed rule would have required only one emission profile at the inlet of a control device, whereas the final rule requires the development of hundreds of emission profiles from a PVCPU. The industry did not have an opportunity to comment on the unworkable new profile requirements. Accordingly, EPA must reconsider the emission profile requirement for process vents.

A. It was Not Feasible to Comment on the Agency's New, Much Broader Approach in the Final Rule to Emission Profiles

EPA initially sought to require emission profiles "for the vent to the control device that describes the characteristics of the vent stream at the inlet to the control device under worst-case conditions."[114] The final rule, however, requires PVC facilities to develop emission profiles for "each contributing continuous process vent, miscellaneous vent and batch process vent."[115]

In addition, the final rule eliminated, without notice, long-standing exclusions from the batch process vent and continuous process vent definitions, certain streams the Agency had determined were *de minimis* (*e.g.*, analyzer vents, sample emissions) or covered under the LDAR program or work practice standards and incorporated into the MON upon its reconsideration. For example, pieces of equipment that are subject to emission limits and work practices for equipment leaks (*e.g.*, valves, sample connection system) are no longer exempt from the batch process vent definition. As such, emissions profiles must be developed for such valves and sampling connections systems under the new characterization requirements of Section 63.11925(g)(1), which apply to batch process vents. Thus, as an initial matter, the Agency's compliance focus changed from consideration of the stream at the inlet to the control equipment,

[112] 77 Fed. Reg. 22,855.

[113] 76 Fed. Reg. 29,577 (to be codified at 40 C.F.R. § 63.11945(b)(3).

[114] 77 Fed. Reg. 22,922 (codified at § 63.11945(c)(3)) (emphasis added).

[115] 77 Fed. Reg. 22,915 (codified at § 63.11925(g)) (emphasis added).

to consideration of data describing the vent stream HAP composition and flow from each of very many process components and emission points.[116]

EPA gave no indication in the proposed rule that it intended such an expansive change to the process vent structure of the PVC MACT, or to terminate the long-standing exclusions for otherwise regulated streams. Thus, the Working Group had no notice of, or opportunity to comment on, this new process vent approach, which came as quite a surprise to the PVC industry.

B. EPA's Burden Assessment of the Expanded Profile Requirements was Mistaken

In promulgating the final rule, the Agency certainly appeared to envision, incorrectly, that the emission profile requirement would impose a very limited burden on PVC facilities:

> *We expect facilities to already have inventories and previous test results available to develop their emissions profile. All of the facilities that provided information in response to the August 21, 2009, PVC CAA section 114 survey, developed emission profiles. Additionally, we are allowing the emissions profile to be based on engineering assessment or measurement. Because of these reasons, we do not anticipate additional burden from this requirement.*[117]

Contrary to this analysis, and contrary to the proposed rule, EPA is requiring, without opportunity for comment, that industry disregard existing emission profiles collected from the inlet to the control device and is requiring a huge profiling effort for initial and ongoing compliance. The final regulatory text encompasses a much broader universe of vents to be profiled, a more comprehensive and, in some cases, impractical testing regime, and much greater reporting requirements than perhaps the Agency realized.

For example, as the Working Group reads 40 C.F.R. § 63.11985(c)(2), PVC facilities must submit a batch precompliance report six months before the rule's compliance date for each and every vent, and each and every emission episode, associated with that batch process. The problem is that the Agency's definition of covered vents appears to encompass apertures, connections, and other points beyond those to the control device. EPA proposed to define continuous process vents, in relevant part as "…the point of discharge to the atmosphere (or the point of entry into a control device, if any) of a gas stream…"[118] The final rule, however, defines "continuous process vent" as:

> *a vent from a continuous PVCPU operation through which a HAP-containing gas stream has the potential to be released to the atmosphere except that it is required by this subpart to [be] routed to a closed vent system and control device…*

Emission profiles for batch process vents must be developed through calculations set forth in 40 C.F.R. § 63.11950. The Administrator must approve any deviations from the listed

[116] Docket Document No. EPA-HQ-OAR-2002-0037-0185, at 10-55.

[117] 77 Fed. Reg. 22,855.

[118] 76 Fed. Reg. 29,596.

equations. Emission profiles, now apparently including data on flow rate and individual HAP concentrations, must be determined for continuous process vents by testing via methods not suited for inprocess pipes, or by engineering assessments. In addition, emission profiles for miscellaneous vents must be determined through an engineering assessment or testing approved by the Administrator. No PVC facility has on hand inventories and test results to address each HAP and flow rate information needed to develop an emission profile for the expanded list of individual process emission points covered by the final rule. Thus, as currently worded, the emission profile reporting and recordkeeping burdens are overwhelming.

C. *The Revised Definition of Continuous Process Vent is Overbroad, Carries Unintended Consequences, and Must be Corrected*

Working Group members are concerned that by eliminating from the definition of "continuous process vent" and "batch process vent" any reference to "the point of discharge to the atmosphere (or point of entry to a control device)" or any other references to discharges to the atmosphere, that the Agency has significantly expanded the scope of the term. In the absence of a regulatory definition for the term "vent," the general and broader meaning of the term as "an opening for the passage or escape of a liquid, gas or vapor,"[119] must apply. Further complicating the issue, "miscellaneous vents" are subsumed in the definition of "process vents," meaning that emissions profiles must be developed for each "gaseous emissions from samples, loading and unloading lines, slip gauges, process wastewater treatment systems and pressure relief devices that are routed through a closed vent system to a control device and that are not equipment leaks." Minor changes in raw materials can impact process vent stream compositions so that emission profile calculations appear to be needed and reported every time a change in recipe takes place. There is an added burden for EPA as well if detailed information on the composition of raw materials and their decomposition products must be submitted to the Agency, as such information must be managed as Confidential Business Information.

In addition, individual batch and miscellaneous vent streams from a typical PVC plant (*see* **Figure 3**) flow to a centralized recovery system (often containing a gasholder where gas stream compositions are mixed and equalized) and then flow as a continuous vent stream to process condensers where the majority of the vinyl chloride and some of the non-VCM HAP is recovered and returned to the process for reuse. Most facilities tested the inlet stream to their control device as part of the Section 114 Request. This data will likely be sufficient with a few other engineering assumptions to determine the maximum load to the control device for the compliance tests. Any further calculations upstream of this point, therefore, are of minimal use with no environmental or regulatory benefit.

XI. Stay of the PVC MACT Pending Reconsideration is Warranted

The Administrator should stay the application of the final PVC MACT rule pending reconsideration. Section 307(d)(7)(B) of the Act authorize an administrative stay during reconsideration. Given the errors, textual ambiguities, and regulatory conflicts identified in the preceding discussions, as well as the resulting impediments to normal operations at PVC facilities, it would be a manifest injustice for the Agency to proceed without staying the final

[119] Webster's II New Riverside University Dictionary 1280 (1988).

rule. Accordingly, the Working Group specifically requests that EPA take all necessary and appropriate steps to stay and defer the compliance deadlines and other provisions of the PVC MACT pending outcome of the reconsideration process.

XII. Conclusion

For the foregoing reasons, the Administrator must convene a proceeding for reconsideration of the PVC MACT Rule, stay implementation of the Rule pending reconsideration, and extend the compliance deadlines applicable to the Rule to reflect the stay period.

LIST OF EXHIBITS

Exhibit No.	Description
Exhibit I	Oxy Vinyls, LP Memorandum re PVC MACT Survey Wastewater Stripper Error, dated June 6, 2012
Exhibit II	E-mail and Wastewater Data from Barry Christensen, Occidental Chemical Corporation, for Oxy Vinyls, LP, to Jodi Howard, EPA, dated September 15, 2010
Exhibit III	Data and Calculation Spreadsheets from 13 PVC Facilities for Wastewater Stripper Discharge Non-Vinyl Chloride TOHAP Limits
Exhibit IV	Process Vent Sampling Flow Rate and Concentration Data for Docket Document No. EPA-HQ-OAR-2002-0037-0107
Exhibit V	PolyOne Concentration Database for Vent Gas Absorbers
Exhibit VI	Generalized Procedure to Evacuate and Service a VCM Filter at a Typical PVC Facility
Exhibit VII	PVC MACT Working Group Analysis of Initial and Monthly Compliance with Car Seal Inspection Requirements
Exhibit VIII	Cost-Benefit Analysis for Release Indicators

EXHIBIT I

Oxy Vinyls, LP Memorandum
re PVC MACT Survey Wastewater Stripper Error,
dated June 6, 2012

OXYVINYLS

Houston Operations
PVC Technical Group

Interoffice Memo

TO:	John Westendorf, Mgr Water & Solid Waste
FROM:	Monica Ortega, Process Engineer
DATE:	06/06/2012
SUBJECT:	PVC MACT Survey Wastewater Stripper Error
Distribution:	Jonathan Witt, PVC Technical Manager; Craig Horak, Production Manager; Jadie Pryor, Environmental Engineer

This memorandum is in response to your questions concerning certain values EPA used to calculate the wastewater stripper emissions limits for major and area sources under the PVC MACT and GACT regulations issued by EPA on April 17, 2012. Specifically, you asked for information on the source of the numbers reported by OxyChem's Deer Park PVC facility in response to EPA's survey request issued in August 2009 to major sources and in September 2009 to area sources, such as the Deer Park PVC facility.

Form K-3 of the survey requested information on the facility's process wastewater streams. Form K-3-b specifically requested HAP and VOC concentration data collected in 2008 for the process wastewater streams. On Form K-3-b, the Deer Park facility reported a sample concentration of 0.018 ppmv for Acetaldehyde in the process wastewater streams (Stream ID #s W-307, W-308 and W-310). We also reported concentrations of 0.065 ppmv for Vinyl Chloride and 0.4 ppmv for "Other" HAPs (same Stream ID #s).

I was asked by my manager in September 2009 to gather information for preparing the survey response for the Deer Park PVC facility. I was aware that the facility collected and analyzed vinyl chloride concentration data at the outlet of the wastewater stripper on a weekly basis, as part of OxyChem's process control program and to verify compliance with the Vinyl Chloride NESHAP regulations. It is the facility's practice that upon receipt of the analytical results, on-site laboratory personnel are responsible for entering the results into a computer software program.

In researching whether any additional process wastewater samples had been collected in 2008, I reviewed the facility's annual 2008 Emissions Inventory (EI) report submitted to the Texas Commission on Environmental Quality in 2009. The EI report included an emissions data sheet for an emission point identified as "DPS-031 Wastewater Stripper." I assumed that the reported data was for the process wastewater stripper. The data sheet reported a concentration of 18.0 ug/liter for Acetaldehyde (essentially equivalent to 0.018 ppmv). It also reported concentrations of 64.5 ug/liter for VOC and 400.5 ug/liter Total Non-VCM. I entered these values onto EPA survey Form K-3-b for the facility's process wastewater streams, which was submitted to EPA on March 3, 2010.

After EPA released the final PVC MACT and GACT standards earlier this year, you reviewed EPA's background documents for calculating the process wastewater emissions limits. EPA included the 0.018 Acetaldehyde value in the MACT and GACT floor calculations, but did not use the VCM or Total Non-VCM values reported by the Deer Park facility. You questioned the source of the 0.018 number and asked me review the source documents. Upon close analysis, we discovered that the data in the EI report identified for the "DPS-031 Wastewater Stripper" was supposed to represent data from a groundwater remediation stripper at the Deer Park facility, not the process wastewater stripper. The groundwater stripper is located in the water treatment facility adjacent to the PVC facility and is completely unrelated to the PVC process wastewater stripper that is regulated by the PVC MACT and GACT standards. This error was not detected until you asked me to review the source numbers reported in the Deer Park facility's survey response after you reviewed EPA's final wastewater emissions limit calculations.

EXHIBIT II

E-mail and Wastewater Data from Barry Christensen, Occidental Chemical Corporation, for Oxy Vinyls, LP, to Jodi Howard, EPA, dated September 15, 2010

From: Howard.Jodi@epamail.epa.gov [mailto:Howard.Jodi@epamail.epa.gov]
Sent: Wednesday, September 15, 2010 6:54 PM
To: Christensen, Barry H.
Subject: Re: Response to More questions regarding PVC test and survey data

Thanks Barry.
****

Jodi Howard, Environmental Engineer
U.S. EPA - Office of Air Quality Planning and Standards Sector Policies and Program Divisions
Coatings and Chemicals Group Mail Code: E143-01 Research Triangle Park, NC 27711
Phone: 919-541-4607 Fax: 919-541-0246

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|<Barry_H._Christensen@oxy.com> |
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| To: |
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|<Howard.Jodi@epamail.epa.gov> |
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|Response to More questions regarding PVC test and survey data |
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Jodi,

enclosed is a few additional data HAP points on wastewater that we took at the time of our sampling. The first sheet for our Pasadena plant encompasses

wastewater that has been steam stripped by our onsite wastewater stripper. The second sheet includes data from our Pedricktown plant that flows directly to the onsite biological wastewater treatment plant operated by PolyOne. It is separate from the process wastewater with VCM that flows separately to the onsite PolyOne steam stripper. We can provide the back up outside laboratory reports should you need them.

Pls let me know of any questions on this data.

Barry Christensen
Occidental Chemical Corp.
Mgr Air Quality
972 404 3209

-----Original Message-----
From: Christensen, Barry H.
Sent: Wednesday, August 25, 2010 3:51 PM
To: 'Howard.Jodi@epamail.epa.gov'
Subject: RE: Response to More questions regarding PVC test and survey data

Jodi,

in the meeting with VI you mentioned you were not able to locate our 4/21/10 submission. We are sending another copy to your attention which you should receive tomorrow.

Thanks for meeting with us yesterday. The meeting prompted some thought on a few other items we can send that may supplement some gaps in information.

(See attached file: OV Wastewater Analytical Data (with MDL values).xls)

Resin Sampling Results for Wastewater Stripper
OxyVinyls, LP
Pasadena, TX

Wastewater Type			Process water					
Flow Diagram Equipment No.			Wastewater stripper (U-1202)					
Flow Diagram wastewater Stream number			Discharge of the wastewater stripper (Stream W-1221) that flows to biological treatment					
Suspension Grade			GP, HMW, LMV*	GP, LMW	GP, HMW, LMW	GP, HMW, LMW	GP, HMW, LMW	GP, HMW, LMW
Date Sampled			12/22/2009	12/29/2009	1/6/2010	1/12/2010	1/19/2010	1/28/2010
Date Received by Lab			12/24/2009	12/31/2009	1/8/2010	1/14/2010	1/21/2010	1/30/2010
Lab Report Number			JA35458	JA35466	JA35476	JA35488	JA35502	JA36409
Compound	CAS No.	Method of Analysis	Concentration (ug/l)					
Ethylene Glycol	107-21-1	DAI by GC/MS 8260 SIM	ND(120)	ND(120)	ND(120)	*ND(120)*	*ND(120)*	*ND(120)*
Benzene	71-43-2	SW846 8260 B	*ND(1.2)*	*ND(1.2)*	*ND(4.7)*	*ND(12)*	*ND(1.2)*	*ND(59)*
Chloroethane	75-00-3	SW846 8260 B	*ND(1.9)*	**2.8 J**	*ND(7.4)*	*ND(19)*	**5.8**	*ND(93)*
Chloroform	67-66-3	SW846 8260 B	*ND(1.2)*	**4.3 J**	*ND(4.7)*	*ND(12)*	*ND(1.2)*	*ND(59)*
Chloromethane	74-87-3	SW846 8260 B	*ND(1.4)*	*ND(1.4)*	*ND(5.8)*	*ND(14)*	*ND(1.4)*	*ND(72)*
1,1-Dichloroethane	75-34-3	SW846 8260 B	*ND(1.4)*	*ND(1.4)*	*ND(5.7)*	*ND(14)*	*ND(1.4)*	*ND(72)*
1,2-Dichloroethane	107-06-2	SW846 8260 B	**2.7 J**	**2.8 J**	*ND(6.7)*	*ND(17)*	**2.6 J**	*ND(83)*
1,1-Dichloroethene	75-35-4	SW846 8260 B	*ND(2.0)*	*ND(2.0)*	*ND(7.9)*	*ND(20)*	*ND(2.0)*	*ND(99)*
Isopropylbenzene	98-82-8	SW846 8260 B	*ND(2.9)*	*ND(2.9)*	*ND(11)*	*ND(29)*	*ND(2.9)*	*ND(140)*
Toluene	108-88-3	SW846 8260 B	*ND(1.5)*	*ND(1.5)*	*ND(6)*	*ND(15)*	*ND(1.5)*	*ND(75)*
2,2,4-Trimethylpentane	540-84-1	SW846 8260 B	*ND(2.2)*	*ND(2.2)*	*ND(8.8)*	*ND(22)*	*ND(2.2)*	*ND(110)*
Vinyl Bromide	593-60-2	SW846 8260 B	*ND(0.50)*	*ND(0.50)*	*ND(2.0)*	*ND(5.0)*	*ND(0.50)*	*ND(25)*
Vinyl Chloride	75-01-4	SW846 8260 B	**40**	**38**	**21**	**36.9 J**	**72**	ND(110)
Xylene (Total)	1330-20-7	SW846 8260 B	*ND(1.3)*	*ND(1.3)*	*ND(5.0)*	*ND(13)*	*ND(1.3)*	ND(63)
Phenol	108-95-2	SW846 8270 C SW846 3510C	*ND(0.58)*	*ND(0.58)*	*ND(0.58)*	*ND(0.58)*	*ND(0.64)*	*ND(0.62)*
Acetophenone	98-86-2	SW846 8270 C SW846 3510C	**5,220**	**9,110**	**4,790**	**9,010**	**9,190**	**9,950**
Hydroquinone	123-31-9	SW846 8270 C SW846 3510C	*ND(5.0)*	*ND(5.0)*	*ND(5.0)*	*ND(5.0)*	*ND(5.6)*	*ND(5.4)*
Methanol	67-56-1	SW846-8015 (DAI)	**656,000**	**858,000**	**806,000**	**490,000**	**265,000**	**620,000**
Formaldehyde	50-00-0	SW846 8315 SW846 8315	**25**	*ND(6.3)*	**162**	*ND(6.3)*	*ND(6.3)*	*ND(6.3)*
Acetaldehyde	75-07-0	SW846 8315 SW846 8315	**844**	**10.1 J**	**8,370**	**85**	*ND(4.8)*	**2,110**

Detected values are reported in bold font.
MDL values are reported in italic font for ND values.

* GP = General Purpose resin
HMW = High Molecular Weight resin
LMW = Low Molecular Weight resin

The samples were analyzed by Accutest Laboratories.

Analytical Sampling Results for Sump, Column, Centrate and Scrubber Wastewater
OxyVinyls, LP
Pedricktown, NJ

Wastewater Type			*LP Sump*	*LP Sump*	*Stripping Column*	*Centrate*	*Centrate*	*Centrate*	*Centrate*	*Centrate*	*Centrate*	*Centrate*	*Centrate*	*Centrate*	*Centrate*	*Centrate*	*Centrate*	*Scrubber*	*Scrubber*	*Scrubber*	*Scrubber*	*Scrubber*	*Scrubber*
Flow Diagram Equipment No.			U-602	U-602	U-203	U-603	U-603	U-603	U-603	U-603	U-603	U-603	U-603	U-603	U-603	U-603	U-603	C-212	C-212	C-212	C-212	C-212	C-212
Flow Diagram wastewater Stream number			W-604	W-604	Equipment Opening condensate to W-604	S-619	S-620	S-620	S-620	S-620	S-620	S-620	S-620	S-620	S-620	S-620	S-620	W-200	W-200	W-200	W-200	W-200	W-200
Suspension Grade			Med and High Molecular Wt.	General Purpose	Med and High Molecular Wt.	Med and High Molecular Wt.	Med and High Molecular Wt.	Med and High Molecular Wt.	Med and High Molecular Wt.	General Purpose	General Purpose	General Purpose	General Purpose	General Purpose	General Purpose	Med and High Molecular Wt.	General Purpose	Med and High Molecular Wt.	Med and High Molecular Wt.	General Purpose	General Purpose	Med and High Molecular Wt.	General Purpose
Date Sampled			11/4/2009	1/17/2009	11/4/2009	11/1/2009	11/2/2009	11/3/2009	11/4/2009	11/9/2009	11/10/2009	11/11/2009	11/13/2009	11/13/2009	11/14/2009	12/19/2009	1/16/2010	11/2/2009	11/4/2009	11/9/2009	11/20/2009	12/19/2009	1/15/2010
Date Received by Lab			11/5/2009	1/17/2009	11/5/2009	11/2/2009	11/3/2009	11/4/2009	11/4/2009	11/9/2009	11/10/2009	11/11/2009	11/13/2009	11/13/2009	11/14/2009	12/20/2009	1/16/2010	11/3/2009	11/4/2009	11/9/2009	11/20/2009	12/20/2009	1/15/2010
Lab Report Number			JA32106	JA37850	JA32106	JA31877	JA31878	JA31992	JA32106	JA32436	JA32471	JA32573	JA32886	JA32886*	JA33006	JA35945	JA37828	JA31878	JA32106	JA32436	JA33536	JA35945	JA37676
Compound	**CAS No.**	**Method of Analysis**	**Concentration (ug/l)**			**Concentration (ug/l)**												**Concentration (ug/l)**					
Ethylene Glycol	107-21-1	DAI by GC/MS 8260 SIM	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	No Test	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)
Benzene	71-43-2	SW846 8260 B	ND(0.23)	ND(0.23)	ND(1.2)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)
Chloroethane	75-00-3	SW846 8260 B	ND(0.37)	**3.0**	**59.0**	ND(0.37)	ND(0.37)	ND(0.37)	ND(0.37)	**1.9**	**2.1**	**1.6**	**2.6**	**2.1**	**5.3**	ND(0.37)	**0.9 J**	ND(0.37)	ND(0.37)	ND(0.37)	ND(0.37)	ND(0.37)	ND(0.37)
Chloroform	67-66-3	SW846 8260 B	ND(0.23)	ND(0.23)	ND(1.2)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	**1.8**	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)
Chloromethane	74-87-3	SW846 8260 B	ND(0.29)	ND(0.29)	**13.4**	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)
1,1-Dichloroethane	75-34-3	SW846 8260 B	ND(0.29)	ND(0.29)	ND(1.4)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)
1,2-Dichloroethane	107-06-2	SW846 8260 B	ND(0.33)	ND(0.33)	ND(1.7)	ND(0.33)	ND(0.33)	ND(0.33)	ND(0.33)	**0.58 J**	**0.52 J**	**0.62 J**	**0.65 J**	**0.61 J**	**0.71 J**	ND(0.33)	ND(0.33)	ND(0.33)	ND(0.33)	ND(0.33)	ND(0.33)	ND(0.33)	ND(0.33)
1,1-Dichloroethene	75-35-4	SW846 8260 B	ND(0.40)	ND(0.40)	ND(2.0)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)
Isopropylbenzene	98-82-8	SW846 8260 B	**2.3**	ND(0.57)	**17.6**	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)
Toluene	108-88-3	SW846 8260 B	ND(0.30)	ND(0.30)	ND(1.5)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)
2,2,4-Trimethylpentane	540-84-1	SW846 8260 B	ND(0.44)	ND(0.44)	ND(2.2)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)
Vinyl Bromide	593-60-2	SW846 8260 B	ND(0.10)	ND(0.10)	ND(0.50)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Vinyl Chloride	75-01-4	SW846 8260 B	**2.5**	**23.4**	**2,960**	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	**3.6**	**3.8**	**2.5**	**3.8**	**3.3**	**11.1**	ND(0.44)	**2.0**	ND(0.44)	ND(0.44)	**1.3**	**0.52 J**	ND(0.44)	**1.4**
Xylene (Total)	1330-20-7	SW846 8260 B	ND(0.25)	ND(0.25)	ND(1.3)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)
Phenol	108-95-2	SW846 8270 C SW846 3510C	**23.8**	**1.7 J**	**25.3**	**15.5**	**20.7**	**24.0**	**26.2**	ND(0.58)	ND(0.58)	**2.0**	**3.1**	**2.5**	**3.7**	**23.2**	ND(0.60)	**20.5**	**23.0**	**3.3**	ND(0.58)	**24.1**	ND(0.58)
Acetophenone	98-86-2	SW846 8270 C SW846 3510C	**1,270**	**255**	**1,310**	**1,410**	**1,600**	**1,360**	**1,840**	**781**	**650**	**776**	**812**	**710**	**950**	**745**	**562**	**243**	**327**	**110**	**184**	**226**	**89.2**
Hydroquinone	123-31-9	SW846 8270 C SW846 3510C	ND(5.0)	ND(25)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.5)	ND(5.2)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.4)	ND(5.0)
Methanol	67-56-1	SW846-8015 (DAI)	**993**	**1,630**	**645**	**870**	**1,310**	**1,000**	**1,270**	**2,000**	**2,230**	**2,010**	**2,320**	**3,480**	**2,710**	**696**	**1,720**	**662**	**328**	**829**	**1220**	ND(34)	**308**
Formaldehyde	50-00-0	SW846 8315 SW846 8315	**610**	**175**	**277 J**	**300**	**589**	**590**	**613**	**464**	**400**	**185**	**161**	**150**	**164**	**276**	**625**	**914**	**1,110**	**756**	**327**	**633**	**300**
Acetaldehyde	75-07-0	SW846 8315 SW846 8315	**1,040**	**411**	**1,830**	**1,200**	**1,650**	**1,630**	**1,060**	**2,140**	**2,150**	**1,900**	**4,340**	**3,670**	**3,460**	**174**	**2,740**	**1,490**	**340**	**2830**	**947**	**659**	**679**

*Duplicate Sample

Detected values are reported in bold font.
Values reported with a "J" indicate an estimated value

The samples were analyzed by Accutest Laboratories

EXHIBIT III

Data and Calculation Spreadsheets from 13 PVC Facilities for Wastewater Stripper Discharge Non-Vinyl Chloride TOHAP Limits

EXHIBIT III
List of Data and Calculation Spreadsheets from 13 PVC Facilities for Wastewater Stripper Discharge Non-Vinyl Chloride TOHAP Limits
(submitted in the enclosed CD)

VI PVC MACT Wastewater Sampling Test Results 6-13-12.xlsx

WW TOHAP Recalc 06062012.xlsx

EXHIBIT IV

Process Vent Sampling Flow Rate and Concentration Data for Docket Document No. EPA-HQ-OAR-2002-0037-0107

Exhibit IV: Process Vent Sampling Flow Rate and Concentration Data for Docket Document No. EPA-HQ-OAR-2002-0037-0107

Facility	Control Device	Flow Rate (Inlet)	Flow Rate (Outlet)	THC Concentration Readings	CH4 Concentration	Other Analytes
FPC – DE	Thermal Oxidizer	Excel Spreadsheet: - PVC MACT FPC DE Testing-Emissions_Data.xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC MACT FPC DE Testing-Emissions_Data.xls Worksheets: - TestingData-Outlet - TestingData-Outlet-jack - TestingData(DioxinFuran)-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC MACT FPC DE Non CBI_CO-THC-CH4_Monitoring.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - PVC MACT FPC DE Testing-Emissions_Data.xls Worksheets: - TestingData-Inlet - TestingData-Outlet - TestingData-Outlet-jack Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - PVC MACT FPC DE Testing-Emissions_Data.xls Worksheets: - All Cell Nos: Rows 39-End, Columns C-E
FPC – TX	Thermal Oxidizer	Excel Spreadsheet: - FPC TX PVC_Testing-Emissions_Data.xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - FPC TX PVC_Testing-Emissions_Data.xls Worksheets: - TestingData-Outlet(VOST HAPs) - TestingData-Outlet (M26A & 320) - TestingData-Outlet (SVOL) - TestingData(DioxinFuran)-Outlet - TestingData(PCB)-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - FPC TX Non-CBI - PVC_CO-THC-CH4_Monitoring.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - FPC TX PVC_Testing-Emissions_Data.xls Worksheets: - All Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - FPC TX PVC_Testing-Emissions_Data.xls Worksheets: - All Cell Nos: Rows 39-End, Columns C-E
FPC – LA	Process Gas Incinerator/ Caustic Scrubber	Excel Spreadsheet: - FPC LA PVC_Testing-Emissions_Data1.xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - FPC LA PVC_Testing-Emissions_Data1.xls Worksheets: - TestingData-Outlet Semivolatile - TestingData-Outlet VolsFTIR - TestingData(DioxinFuran)-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - FPC LA Non CBI PVC_CO-THC-CH4_Monitoring.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - FPC LA PVC_Testing-Emissions_Data1.xls Worksheets: - All Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - FPC LA PVC_Testing-Emissions_Data1.xls Worksheets: - All Cell Nos: Rows 39-End, Columns C-E
Georgia Gulf – Aberdeen	Thermal Oxidizer	Excel Spreadsheet: - Georgia_Gulf_Aberdeen_PVC_Testing- Emissions_Data Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - Georgia_Gulf_Aberdeen_PVC_Testing-Emissions_Data Worksheet: - TestingData-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - GeorgiaGulf_Aberdeen_PVC_CO-THC-CH4_Aberdeen_Monitoring_Final Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - GeorgiaGulf_Aberdeen_PVC_CO-THC-CH4_Aberdeen_Monitoring_Final Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - Georgia_Gulf_Aberdeen_PVC_Testing-Emissions_Data Worksheet: - All Cell Nos: Rows 39-End, Columns C-E
Georgia Gulf – Plaquemine	Thermal Oxidizer	Excel Spreadsheet: - Georgia Gulf Chemicals_Plaquemine_PVC_Testing-Emissions_Data Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - Georgia Gulf Chemicals_Plaquemine_PVC_Testing-Emissions_Data Worksheet: - TestingData-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - Georgia Gulf Chemicals_Plaquemine_PVC_CO-THC-CH4_Monitoring Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - Georgia Gulf Chemicals_Plaquemine_PVC_CO-THC-CH4_Monitoring Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - Georgia Gulf Chemicals_Plaquemine_PVC_Testing-Emissions_Data Worksheet: - All Cell Nos: Rows 39-End, Columns C-E

Facility	Control Device	Flow Rate (Inlet)	Flow Rate (Outlet)	THC Concentration Readings	CH4 Concentration	Other Analytes
Oxy – Deer Park	LaPorte Thermal Oxidizer	Excel Spreadsheet: - Testing-Emissions Data Deer Park.xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - Testing-Emissions Data Deer Park.xls Worksheets: - TestingData(SVOCs)-Outlet - TestingData(VOC)-Outlet - TestingData(DioxinFuran)-Outlet - TestingData(PCB)-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - CO-THC-CH4 Deer Park MonitoringNC.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - Testing-Emissions Data Deer Park.xls Worksheets: - All Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - Testing-Emissions Data Deer Park.xls Worksheets: - All Cell Nos: Rows 39-End, Columns C-E
Oxy – Pasadena	Thermal Oxidizer	Excel Spreadsheet: - Testing-Emissions Data NC.xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - Testing-Emissions Data NC.xls Worksheets: - TestingData(VOC)-Outlet - TesingData(HCLCL2)-Outlet - TesingData(SVOC)-Outlet - TestingData(DioxinFuran)-Outlet - TestingData(PCB)-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - CO-THC-CH4_Monitoring Pasadena NC.xls Worksheet: - CO-THC-CH4 Monitoring Data (B) Cell Nos: Column D	Excel Spreadsheet: - Testing-Emissions Data NC.xls Worksheets: - All Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - Testing-Emissions Data NC.xls Worksheets: - All Cell Nos: Rows 39-End, Columns C-E
Shintech – Addis	Thermal Oxidizer/ Scrubber	Excel Spreadsheet: - PVC_Testing-Emissions_Data.xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC_Testing-Emissions_Data.xls Worksheets: - TestingData-Outlet - TestingData(DioxinFuran)-Outlet - TestingData(PCB)-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC_CO-THC-CH4_Monitoring.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - PVC_Testing-Emissions_Data.xls Worksheets: - All Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - PVC_Testing-Emissions_Data.xls Worksheets: - All Cell Nos: Rows 39-End, Columns C-E
Shintech – Freeport	Incinerator/ Scrubber	Excel Spreadsheet: - Shintech PVC_Testing-Emissions_Data 022610.xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - Shintech PVC_Testing-Emissions_Data 022610.xls Worksheets: - TestingData-Outlet - TestingData(DioxinFuran)-Outlet - TestingData(PCB)-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - Shintech 30-Day PVC_CO-THC-CH4_Monitoring 022610.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - Shintech PVC_Testing-Emissions_Data 022610.xls Worksheets: - All Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - Shintech PVC_Testing-Emissions_Data 022610.xls Worksheets: - All Cell Nos: Rows 39-End, Columns C-E
Shintech – Plaquemine	Thermal Oxidizer/ Scrubber	Excel Spreadsheet: - PVC Testing-Emissions Data.xls Worksheet: - TestingData-Inlet_PVC Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC Testing-Emissions Data.xls Worksheet: - TestingData-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC CO-THC-CH4 Monitoring.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - PVC Testing-Emissions Data.xls Worksheet: - TestingData-Outlet Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - PVC Testing-Emissions Data.xls Worksheet(s): - TestingData-Outlet - TestingData(DioxinFuran)-Outlet Cell Nos: Rows 39-End, Columns C-E

Facility	Control Device	Flow Rate (Inlet)	Flow Rate (Outlet)	THC Concentration Readings	CH4 Concentration	Other Analytes
Westlake – Calvert City	Thermal Oxidizer	Excel Spreadsheet: - PVC_Testing-Emissions_Data- Calvert City_2-26-10 .xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC_Testing-Emissions_Data- Calvert City_2-26-10 .xls Worksheets: - TestingData-Outlet - TestingData(DioxinFuran)-Outlet - TestingData(PCB)-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC_CO-THC-CH4_Monitoring-Calvert City_2-26-10.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - PVC_Testing-Emissions_Data- Calvert City_2-26-10 .xls Worksheets: - All Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - PVC_Testing-Emissions_Data- Calvert City_2-26-10 .xls Worksheets: - All Cell Nos: Rows 39-End, Columns C-E
Westlake – Geismar	Primary and Oxy Incinerators, Incinerator Scrubber	Excel Spreadsheet: - PVC_Testing-Emissions_Data-Geismar.xlsx Worksheets: - TestingData-Inlet (PVC WET) - TestingData-Inlet (PVC DRY) - TestingData-Inlet (OXY REACTOR) - TestingData-Inlet (UVS) Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC_Testing-Emissions_Data-Geismar.xlsx Worksheets: - TestingData-Outlet - TestingData(DioxinFuran)-Outlet - TestingData(PCB)-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC_CO-THC-CH4_Monitoring-1-Geismar.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - PVC_Testing-Emissions_Data-Geismar.xlsx Worksheets: - TestingData-Outlet - TestingData(DioxinFuran)-Outlet - TestingData(PCB)-Outlet Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - PVC_Testing-Emissions_Data-Geismar.xlsx Worksheets: - All Cell Nos: Rows 39-End, Columns C-E
PolyOne – Henry	VGA	Excel Spreadsheet: - Henry-PVC_Testing-Emissions_Datafor VI.xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - Henry-PVC_Testing-Emissions_Datafor VI.xls Worksheet: - TestingData-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - Henry- PVC_CO-THC-CH4_Monitoring.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - Henry-PVC_Testing-Emissions_Datafor VI.xls Worksheets: - TestingData-Inlet - TestingData-Outlet Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - Henry-PVC_Testing-Emissions_Datafor VI.xls Worksheets: - TestingData-Inlet - TestingData-Outlet Cell Nos: Rows 39-End, Columns C-E
PolyOne – Pedricktown	VGA	Excel Spreadsheet: - PolyOne Pedricktown PVC_Testing-Emissions_Data for KH.xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PolyOne Pedricktown PVC_Testing-Emissions_Data for KH.xls Worksheet: - TestingData-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PolyOne Pedricktown PVC_CO-THC-CH4_Monitoring.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - PolyOne Pedricktown PVC_Testing-Emissions_Data for KH.xls Worksheets: - TestingData-Inlet - TestingData-Outlet Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - PolyOne Pedricktown PVC_Testing-Emissions_Data for KH.xls Worksheets: - TestingData-Inlet - TestingData-Outlet Cell Nos: Rows 39-End, Columns C-E
Oxy – Pedricktown	VGA	Routed through PolyOne Pedricktown facility	Routed through PolyOne Pedricktown facility	Routed through PolyOne Pedricktown facility	Routed through PolyOne Pedricktown facility	Routed through PolyOne Pedricktown facility

EXHIBIT V

PolyOne Concentration Database for Vent Gas Absorbers

EXHIBIT V
List of PolyOne Concentration Databases for Vent Gas Absorbers
(submitted in the enclosed CD)

Henry- PVC_CO_CEMS_Monitoring.xls

Henry- PVC_CO-THC-CH4_Monitoring.xls

Henry-PVC_Testing-Emissions_Data.xls

PolyOne Pedricktown PVC_CO_CEMS_Monitoring.xls

PolyOne Pedricktown PVC_CO-THC-CH4_Monitoring.xls

PolyOne Pedricktown PVC_Testing-Emissions_Data.xls

EXHIBIT VI

Generalized Procedure to Evacuate and Service a VCM Filter at a Typical PVC Facility

SCOPE: This procedure describes the steps necessary to evacuate and service the VCM filters.

- Removing from service
- Returning to service

REQUIREMENTS: The poly floor operator is responsible for performing this procedure. Maintenance must wear fresh-air when opening the filter.

Used filter elements must be placed in plastic bags and removed from the poly floor roof and disposed of in the BFI bin.

RELEVANT DOCUMENTS VCM MSDS

DEFINITIONS None

PROCESS EQUIPMENT : VCM Charge Line II VCM Charge Filter RVCM Filters, Virgin VCM Filter

MATERIALS/EQUIPMENT (36) Filter cartridges

SAFETY Hazardous materials are materials that present a health and/or physical hazard. Refer to the attached chemical description which lists the hazardous material, the hazards they present and the controls used to minimize the hazard.

QUALITY This is a quality critical procedure. The filter elements must be installed properly to prevent quality problems.

ENVIRONMENTAL There are environmental regulations associated with the opening of this equipment that must be properly followed throughout this procedure. The filter elements must be disposed of properly to comply with environmental regulations.

PROCEDURE

REMOVING FROM SERVICE

1.0 Approval

1.1 Request the use of the #1 vacuum pump.

1.2 Verify with the DCS operator which filter is to be serviced.

NOTE

The servicing of the VCM charge filters must be coordinated with the DCS operator to ensure reactor charges are not delayed.

1.3 Close and lock the following valves on the filter:

- Inlet valve from charge pump
- Outlet valve to reactor
- Relief valve to LP header valve

1.4 Open the drain valve to the RVCM receivers.

NOTE

By draining off as much liquid VCM as possible to the receivers, evacuation of the filters will be more efficient.

1.5 Close and lock the drain valve when the pressure is equalized between the filter and the RVCM receivers.

2.0 Evacuate the Filter

2.1 Open the upper block valve to the evacuation and purge header.

2.2 Monitor the filter to ensure the pressure is dropping.

2.3 Slowly open the drain valve on the bottom of the filter once a vacuum is established on the filter.

2.4 Close the drain valve.

2.5 Remove the plug from the drain valve at the bottom of the filter.

WARNING

Block valves can leak through causing VCM vapors to build behind plugs. Remove plugs slowly to prevent possible VCM exposure.

2.6 Insert a Chicago coupling into the drain valve.

2.7 Connect a steam hose to the drain valve.

NOTE

The condensate should be blown out of the steam hose before connecting to the filter.

2.8 Slowly open the steam to the filter once a vacuum on the filter is reached.

NOTE

Monitor the filter pressure on the local pressure gauges on the filter. Once the filter housing and the piping are warm, let the filter steam for 5 minutes to ensure the filter is clear of VCM.

2.9 Close the following valves:

- Steam to the filter at the hose station
    - Close and lock upper and lower block valves to the evacuation and purge header

NOTE

Lock sample valve to sample station.

2.10 Disconnect the steam hose from the filter.

WARNING

Ensure that filter is under a vacuum after the steam hose is blocked in. This will ensure that all of the hot condensate has been removed from the hose to prevent serious burns when removing.

2.11 Notify the DCS operator that you are through with the vacuum pump.

3.0 Prepare the Filter for Opening

3.1 Have the DCS operator start up the steam jet.

3.2 Open the block valve on the filter to align the filter to the steam jet.

3.3 Open the drain valve at bottom of filter to pull air through the filter.

NOTE The steam jet should be allowed to pull air through the filter for 2-3 minutes to ensure it is cool enough for maintenance to begin work.

3.4 Close and tag the block valve to the steam jet. Must be able to use valve if necessary - (ex: pressure build up from a valve leaking by, etc.)

3.5 Notify the DCS operator you are finished with the steam jet.

4.0 Open the Filter

4.1 Have maintenance tag lock box.

4.2 Issue permit to maintenance.

WARNING

Maintenance must wear all required PPE (gloves, fresh air) while removing the filter head to prevent exposure to VCM and/or burns from hot piping.

4.3 Collect an opening/loss sample with a MiniRAE meter.

4.4 Record the results on the work permit.

4.5 Allow maintenance to begin replacing elements.

4.6 Inspect the filter elements for damage and general condition.

4.7 Inform the Lead Operator of the condition of the filter elements.

NOTE

Some or all of the elements may be saved to let the technical group inspect.

RETURNING TO SERVICE

1.0 Place Filter Back in Service

1.1 Ensure there is no debris in the filter pot.

1.2 Verify the filter elements stabilizing ring is installed.

1.3 Ensure a new head gasket is installed.

1.4 Have maintenance place the head on the filter and secure.

2.0 Pressure Test the Filter

2.1 Connect an air hose to the drain valve on the bottom of the filter.

2.2 Pressure up the filter to 80 psig with air.

2.3 Block in the air to the filter.

2.4 Soap test for leaks. If OK, have maintenance remove tags from lock box.

WARNING
The filter must be leak tight to prevent employee exposure to VCM vapors, and to prevent any leaks to atmosphere.

3.0 Evacuate the Filter

3.1 Block in the drain valve at the bottom of the filter.

3.2 Disconnect the air hose and install the plug.

3.3 Have the DCS operator start up the steam jet.

3.4 Open the block valve to the steam jet.

CAUTION
Ensure the filter is pulled into a good vacuum to remove any oxygen which would affect product quality and to prevent a reaction between VCM and oxygen.

4.0 Return the Filter to Service

NOTE If the filter shall remain on stand-by, it is left evacuated.

4.1 Unlock and open the valve from the filter outlet to the charge header and remove the tag.

4.2 Unlock and open the filter inlet and remove the tag.

4.3 Align the sample station.

4.4 Notify the DCS operator the filter is back in service (VCM charge filters).

5.0 Perform Housekeeping

5.1 Roll up hoses and store.

5.2 Return the MiniRAE to storage and place on charger.

5.3 Ensure the plugs are in the valves.

5.4 Ensure the filter elements are disposed of properly.

SERVICING RELIEF VALVES

1.0 Prepare to Service the Relief Valve

1.1 Obtain approval from the production superintendent and/or Lead Operator.

1.2 Ensure maintenance is ready.

1.3 Isolate the filter.

1.4 Evacuate the filter.

NOTE Refer to the section "Removing From Service" in this procedure for specific instructions.

2.0 Prepare the filter for Maintenance

2.1 Unlock and close the tagged block valve to the low pressure (LP) header.

2.2 Lock and tag the LP header valve in the closed position.

2.3 Issue permits.

3.0 Inspect the Relief Valve and Rupture Disk

3.1 Compare the tag information on the one removed from service to the one being installed.

- Set pressure/temperature
- Size

3.2 Ensure the relief valve/rupture disk is installed properly:

- Proper type bolts/studs (no all-thread rods)
- Bolts tightened evenly
- Proper type, size, and number of gaskets

4.0 Service the Filter

NOTE
The filter is serviced each time it is evacuated/steamed.

5.0 Pressure

5.1 Connect an air hose to the drain valve on the bottom of the filter.

5.2 Pressure up the filter to 80 psig with air.

5.3 Soap test for leaks.

WARNING

The filter and relief valve assembly must be leak tight to prevent employee exposure to VCM vapors and any leads to the atmosphere. If any leaks are found, vent the pressure and repair the leak(s). Pressure up again and check for leaks.

5.4 Block, bleed, and disconnect the air hose.

5.5 Vent the pressure to the atmosphere.

5.6 Close the drain valve and install plug.

6.0 Align the Relief Valve

6.1 Unlock and open the valve to the LP header.

6.2 Lock and tag the valve in the open position.

Temporary Operation

7.0 Temporary Operation

7.1 When temporary operations are required, the Production Superintendent will develop procedures before they begin. An MOC (Management of Change) will be generated. Training will be conducted and documented.

Emergency Operation

8.0 Emergency Operation

8.1 When emergency operations are required, the Production Superintendent will coordinate with the Lead Operator on duty. Training will be conducted and documented at the time of the emergency.

Emergency Shutdown

9.0 Emergency Shutdown 9.1 Block in inlet, outlet, and all bleed valves.

CONSEQUENCES OF DEVIATION AND STEPS TO RECOVER

Procedure Step	Problem Description	Consequence of Deviation	System Response	Tag Number	Steps to Recover
2.10	Failure to ensure filter is under a vacuum after steam hose blocked in	Operator could be potentially sprayed with hot condensate resulting in burns	None	N/A	Repeat training, monitor vacuum before disconnecting steam hose
2.4, 5.3	Failure to soap test for leaks	Potential employee exposure to leaking VCM vapors, potential reportable release	Area GC monitors, LEL detection system	N/A	Tighten bolts if leaking gasket, or shutdown, evacuate, and make repairs

Rev. #	Change	Training Required Yes/No
0	Initial issue.	Yes
1	Added third bullet to step 1.3. Replaced the word tag with lock. Added note after step 2.9. Revised step 3.4. Added steps 7.0, 8.0 & 9.0.	Yes

REVISIONS/TRAINING TABLE

VINYL CHLORIDE MONOMER (VCM)

DESCRIPTION: A colorless, sweet smelling gas at atmospheric pressure and room temperature.

PROPERTIES: Flammable and toxic. Cancer suspect agent.

HAZARDS: Harmful if inhaled. Causes thermal burns. Rapid evaporation of the liquid causes frostbite to skin and eyes.

SYMPTOMS: Loss of sensation, state of stupor, and loss of

consciousness. PPE:

Refer to PPE Sampling Matrix for specific PPE, required when sampling. Airline respirator, chem-proof gloves and rubber boots. Splash suit if possible danger of splash.

CONTROL: In the event of a leak, eliminate ignition sources, notify the supervisor, and stop or control the leak if it can be achieved without undue risk. Use water spray to disperse vapors and protect personnel.

FIRST AID:

Eyes: Immediately flush eyes with water for 15 minutes. Forcibly hold eyelids apart to ensure irrigation of all eye and lid tissue. Seek medical attention.

Skin: If direct liquid contact occurs, flush with water. If frostbite or burn occurs, do not rub the area. Get immediate medical attention.

Inhalation: Move victim to fresh air. Apply appropriate first aid treatment as necessary. Get immediate medical attention.

Ingestion: N/A

REFER TO THE MSDS FOR ADDITIONAL INFORMATION

EXHIBIT VII

PVC MACT Working Group Analysis of Initial and Monthly Compliance with Car Seal Inspection Requirements

Operational Actions to Comply with EPA's PVC MACT Bypass Provisions

06.07.2012

Operational Actions to Comply with EPA's PVC MACT Bypass Provisions

Notes:

1. Since there are no bypass exemptions, any component within the closed vent system (CVS) that could cause a HAP-containing gas stream to be diverted away from the control device and then be discharged to the atmosphere must have a bypass indicator (i.e., flow indicator & alarm; or, a car-seal/lock & key mechanism), including any of the following no matter what size (e.g., ½ in valve on a drain):
    a. Low leg drains;
    b. High point bleeds;
    c. Valves on open ended lines;
    d. Pressure relief devices; and,
    e. Analyzer vents.
2. Since there is no clear exemption for equipment that has met the PVC MACT equipment opening requirements; any HAP release event must be considered, including:
    a. Any remaining fugitive HAP gases after the equipment opening emission standard at 40 CFR 63.11955 has been met; and,
    b. Vapor collection systems from miscellaneous vents (e.g., loading lines)
    c. Exhaust gas from analyzer vents, such as a ambient air monitoring system required by 40 CFR 63.11956
3. In addition, consideration must be made to any bypass that could "cause air intrusion into the control device" (40 CFR 63.11930(g)(1)); for example:
    a. Manway hatch on a CVS Knockout pot
4. Burden to comply with the Bypass provisions is considered an independent burden from the CVS Inspection and Monitoring requirements (e.g., initial inspection using EPA Method 21 monitoring procedures; and, annual audio, visual, olfactory (AVO) inspection thereafter).

Summary of Actions Required in Order to Comply:

Action #1: Identifying affected Closed Vent System (CVS) equipment and potential bypasses prior to installing Bypass indicators

Action #2: Develop and implement procedures to prevent/minimize bypass "violations" and certify compliance including:

1. Ensuring bypass indictor changes are tracked (e.g., flow indictors alarms, car seal is broken);
2. Required actions are performed (e.g., if alarm is triggered; identify the cause); and,
3. Required records and reports are maintained and retained; including potential release events.

Action #3: Develop and implement Added/ Removed Car-Seal Tracking Procedures and other data Quality Assurance/Quality Control (QA/QC) checks

Action #4: Conduct Bypass Training

Specific Details Follow Below

Action #1: Identifying affected Closed Vent System (CVS) equipment prior to bypass indicator installation, which includes the following steps:

Step 1.1: Determining Regulatory Applicability:
Determine if there are any other regulatory overlaps with the PVC MACT (e.g., CVS is shared with HON regulated Unit; State-required CVS special conditions)

Step 1.2: P&ID Review and Speciation
The Operations Department and the Environmental Department review P&IDs to determine which CVS Bypass components are "in HAP service," and which are reasonably expected not to be exceed 5% wt. HAPs.

Step 1.3: Field Verify
The Operations Department, combined with the efforts of the Environmental Department, will field verify the location of the CVS Bypass equipment and confirm existing speciation of chemicals that could be diverted through the bypass component.

Step 1.4: Install Bypass flow indicator or hang Car-seal
The Operations Department will install the bypass indicator equipment, which may entail the need to rent a lift to raise personnel up to a bypass valve; shut down of equipment that is unsafe to work on (e.g., too hot; under construction scaffolding); obtain safety permits, etc.

Step 1.5: Establish database/log sheet of affected bypass equipment
Data elements necessary for finding and inspecting regulated components include some of the following, using a car-seal example:

- Unit
- Process Area
- Equipment
- Car Seal Number
- Component Type (e.g. valve, pressure relief device, etc.)
- Size
- Service Type
- Applicable Rule (if overlap; determine which supersedes)
- Location Description
- Accessibility (difficult to monitor?, unsafe to monitor?)
- Process Stream Identification
- Process and Identification Drawing (P&ID) Number
- Safety equipment necessary to perform inspections

Action #2: Develop and implement procedures for:

1. Ensuring bypass indictor changes are tracked (e.g., flow indictors alarms, car seal is broken);
2. Required actions are performed (e.g., if alarm is triggered; identify the cause); and,
3. Required records and reports maintained and retained; including potential release events and CVS leak repairs.

ASSUME CAR-SEALS ARE INSTALLED:

Step 2.1: Visually inspect car seal monthly:

- Develop and implement inspection route & inspection forms
- Complete inspection to determine if car seal is still in place (e.g., did not fall off due to deterioration) or broken due to discharge through the valve; and/or, replaced with new Car-Seal mechanism/ID number.

Record:

- Date,
- Car Seal number
- Inspection results, including bypass valve position.

Step 2.2: If opening a car-sealed bypass for any reason:
Complete Car seal tracking form: Record date, time, Car seal number and if emissions occurred.
If emissions occurred: Record the following information:

- Date and time the bypass was opened/closed;
- The duration of the flow in the bypass;
- Records of the times of all periods when the vent stream is diverted from the control device or the flow indicator is not operating;
- Complete emission estimations; and,
- **Because Event is considered a violation**: Follow PVC MACT "Affirmative Defense" provisions, with a "preponderance of evidence" to support valve change is not a "violation" (see 63.11930(c)(2)(ii) and 63.11895).

Step 2.3: Records & Reporting

Report:

- Semi-annually within PVC MACT Report: Each instance for which a bypass valve is changed to the diverting position.
- Other Repotting mechanisms (e.g., Semi-Annual Title V Deviations Report; annual Emissions Inventory, etc.)

Action #3: Develop and implement Added/ Removed Car-Seal Tracking Procedures needed to ensure that covered equipment added to/ removed from the Unit for any reason is integrated into the Car-Seal inspection and reporting program

Step 3.1: Rectify Car Seal Numbers

- Car seal numbers on the monthly inspection sheet need to match up with the car seal numbers in the field.
- During a turnaround or complex maintenance event; numerous maintenance-type valves, like low-leg drains, will be opened.
- As such, new car seals are installed; the old car seal number needs to be retired from the inspection sheets and a new car seal number inserted.
- Rectifying car seal numbers may take considerable effort if 100-200 maintenance-type bypass valves are open during a major turnaround.

Action #4: Bypass Training – Procedures and training protocols are needed to describe actions to be taken if a bypass release occurs; what to look for during car-seal inspections, etc.

Step 4.1 By Pass Training: Since monthly inspections are needed; car seals number tracked; broken car seals replace, compliance certifications required, etc. in order to prevent "violations," training on the issue needs to be provided to the following personnel:

- Operations Department;
- Maintenance Department;
- Instrumentation Department;
- Contractors; and,
- Environmental Department.

Step 4.2: Compliance certifications: Due to the specific PVC MACT requirements to certify compliance (e.g., 40 CFR 63.11985(a)(9)), the following types of personnel also need to be trained on the requirements:

- The Responsible Official;
- Site Managers; and/or
- Vice Presidents/ General Managers

Bypass Burden Cost Estimate: PVC MACT

By Pass Labor Burden Cost Estimate: PVC MACT

Actions	Initial	Annual
Step 1.1 Determine Regulatory Applicability		
Assume: 2 Eng. 4 hrs	$ 664.08	
Step 1.2: P&ID Review and Speciation		
Assume: 2 Eng for 24 hr	$ 3,984.48	
Step 1.3: Field Verify		
Assume: 2 Eng for 24 hr & 1 Op. for 24 hr	$ 5,129.52	
Step 1.4: Install Bypass flow indicator or hang Car-seal		
Assume: 2 Op. for 20 min/bypass	$ 11,132.33	
Step 1.5: Establish database/log sheet of affected bypass equipment		
Assume 1 Eng for 40 hr	$ 3,320.40	
Step 2.1: Visually inspect car seal monthly:		
Assume Polyolefins Inspection Rate by Op.: 7 min/bypass		$ 23,377.90
Step 2.2: Actions if opening a car-sealed bypass (Violation; must investigate & develop corrective actions):		
Assume 1 Op, 1 Eng & 1 Mgr 1 hr/event		$ 733,265.92
Step 2.3: Records & Reporting		
Assume 1 Eng & 1 Mgr 2 hr/month		$ 4,905.36
Step 3.1: Rectify Car Seal Numbers		
Assume 1 Eng for 2 hr/month		$ 1,992.24
Step 4.1 By Pass Training:		
All Operations & Env. Employees (assume 50) 2 hr initial	$ 4,771.00	
Responsible Official/Site Managers, (assume 3) for 30 min initial	$ 182.07	
Total per PVC Unit:	**$ 29,184**	**$ 763,541**
Total all 15 major & 2 area PVC Units	**$ 496,126**	**$ 12,980,204**
Annual Cost Per Bypass		**$ 2,182**

Hourly Rates (from EPA's Air Poll. Control Cost Manual):

Operator/Supervisor	$ 47.71
Process/Env. Engineer/Tech	$ 83.01
Management	$ 121.38
	Example PVC Unit:
Number of Car Sealed bypasses	350
Number of Car Seals broken in a year	
1. Reactor Opening (assume 4 Reactors)	
Four Bypass valves open daily/ Reactor	5840
2. Maintenance Valves in non T/A Year	200
Total:	6040

VOC tpy release*	TPY VOC
Small Equipment	2
Large Equipment	1.4
Total per Unit:	**3.4**
Total MSS all 17 PVC Units:	57.8
*MSS Calc for a suspension PVC Unit -	
assume residual emitted from bypass is 10%	
of total emitted	
Total Fugitive HAPs Emitted	
from Maintenance Bypasses by all PVC Units	5.78
Cost Effectiveness ($/ton VOC)	$ 2,245,710
Potential Penalty/ Violation	$37,500

T/A= Turnaround

MSS = Maintenance, Startup, Shutdown emissions

EXHIBIT VIII

Cost-Benefit Analysis for Release Indicators

EXHIBIT VIIIa

Westlake Cost Estimates from Honeywell

AWC

Customer Details		Quotation	
Name :	Allen Bodron	Quotation Date :	03/15/2012
Company :	Westlake Chemical		
Address :		Quote From :	Randy Hamilton
Tel :		Reference :	
Fax :			

Subject: XYR6000 (Pressure Transmitter Option)

Dear Allen,

This is budgetary quote per your request. This proposal at this time does not reflect project pricing or bundling of items in starter kit fashion to save cost. Two WDM and two FDAT are quoted to reflect redundancy aspect you are trying to achieve. Release 210 will have redundancy already integrated and this will be released end of this year. The fastest scan time available with this solution is 1 sec with this wireless technology. If you have any questions pleas feel free to call.

Regards,

Randy Hamilton
Account Manager

Pos	Qty	Description	Unit Price	Total
1	2	WDMS-00-KD-000-00 OneWireless Device Manager OneWireless Network R200 Documentation Kit	$ 4,298.00 	$ 8596.00
2	2	FDAP2-F6SA00-F6SA00-WM-DD-0000 OneWireless Field Device Access Point with Class 1 Div 2 certification DSSS Ant. 1Opt.: 6 dBi Integral Omni DSSS Ant. 1Opt.:with Integral Lightning Surge Arrestor DSSS Ant. 1Opt.:No Cable DSSS Ant. 2 Opt.: 6 dBi Integral Omni DSSS Ant. 2 Opt.:with Integral Lightning Surge Arrestor DSSS Ant. 2 Opt.:No Cable Wall mount kit OneWireless Network R200 Electronic Documentation on CD	$ 3,444.00 	$ 6888.00
3	50	STGW94L-E1A-00000-R0000-XF,BA,1C-NA00 XYR 6000 Wireless Transmitter In-Line Gage & Absolute Pressure Series 900 Gage pressure : 0-20 to 0-500 psig/0-1.4 to 0-35 bar 316 SS wetted process head, 316L SS barrier diaphragms Silicone fill fluid Process connection configuration : 9/16" - 18 Aminco Integral Right-angle, vertical 4 dBi None None 2.4 GHz Frequency Hopping Spread Spectrum (FHSS) Battery FM IS, Explosion proof, non incendive, non sparking North America,Canada	$ 3,164.00 	$158200.00
4	1	Dolphin Handheld for Downloading Keys	$ 1700.00	$ 1700.00

AWC

Customer Details		Quotation	
Name :	Allen Bodron	Quotation Date :	03/15/2012
Company :	Westlake Chemical		
Address :		Quote From :	Randy Hamilton
Tel :		Reference :	
Fax :			

Subject: XYR6000 (Digital Input Option)

Dear Allen,

This is budgetary quote per your request. This proposal at this time does not reflect project pricing or bundling of items in starter kit fashion to save cost. Two WDM and two FDAT are quoted to reflect redundancy aspect you are trying to achieve. Release 210 will have redundancy already integrated and this will be released end of this year. The fastest scan time available with this solution is 1 sec with this wireless technology. If you have any questions pleas feel free to call.

Regards,

Randy Hamilton
Account Manager

Pos	Qty	Description	Unit Price	Total
1	2	WDMS-00-KD-000-00 OneWireless Device Manager OneWireless Network R200 Documentation Kit	$ 4,298.00 	$ 8596.00
2	2	FDAP2-F6SA00-F6SA00-WM-DD-0000 OneWireless Field Device Access Point with Class 1 Div 2 certification DSSS Ant. 1Opt.: 6 dBi Integral Omni DSSS Ant. 1Opt.:with Integral Lightning Surge Arrestor DSSS Ant. 1Opt.:No Cable DSSS Ant. 2 Opt.: 6 dBi Integral Omni DSSS Ant. 2 Opt.:with Integral Lightning Surge Arrestor DSSS Ant. 2 Opt.:No Cable Wall mount kit OneWireless Network R200 Electronic Documentation on CD	$ 3,444.00 	$ 6888.00
3	50	STXW500-000-0000-R0000-XF,BA,TG,SB,1C-EU00 XYR 6000 Wireless Multi Discrete Input Transmitter Series 500 Wireless Transmitter with Three Discrete Inputs Integral Right-angle, vertical, 4dBi 2.4 GHz Frequency Hopping Spread Spectrum (FHSS) Battery Stainless Steel Customer Wired-On Tag Mounting Bracket - 304 SS FM,IS,Explosion-proof,Nonincendive,Non-Sparking For use in European Union	$ 2,600.00 	$130,000.00
4	50	Fike BDI (Burst Disk Indicator)	$ 250.00	$ 12,500.00
5	1	Dolphin Handheld for Downloading Keys	$ 1700.00	$ 1700.00

EXHIBIT VIIIb

Westlake Cost Estimates from Champion Technology Services

From: "Mehrdad Ghorashi" <Mehrdad.Ghorashi@champtechnology.com>
To: "Bodron, Allen" <abodron@westlake.com>
Sent: Monday, March 26, 2012 10:28 AM
Subject: EPA OPC Data Integration to Honeywell

Allen,

Per our discussion, I have the following scope captured:

1) Establish OPC Connectivity to Data Server
2) Build of 50 OPC Points to the Honeywell SCADA
3) One (1) tabular graphic showing all data points

If the OPC server is remote to your Honeywell servers, I recommend purchasing and installing Honeywell's OPC tunneller (~$2,400) to make the connection to the remote OPC server so you don't have to compromise the security settings of the Honeywell servers..

Here is the cost breakdown:

1) Services - $4,400 (T&M @$110/hr)
   a. Install necessary software
   b. Build Channel and Controller for OPC data
   c. Build 50 EPA Quickbuilder points
   d. Develop 1 graphic displaying data points

2) Software – OPC Tunneller - $2,400

   Total cost = $6,800

Feel free to call me with any questions or comments.

Thanks,

Mehrdad Ghorashi
Business Manager
Champion Technology Services, Inc.
17991 Old Perkins Rd. East, Suite E ****Please note new office address and phone number****
Baton Rouge, LA 70809
Office: 225-615-8120
Cell: 225-802-2179
Fax: 225-612-6394
email: Mehrdad.ghorashi@champtechnology.com
www.champtechnology.com

EXHIBIT VIIIc

Dow Chemical Corporation Cost Estimates for Wired PSV System

Dow Chemical Corporation Cost Estimate for Wired PSV System With Installation of an Additional Junction Box

Project Cost Estimate Summary Report

Global Project Controls

Rev. 1.30

Dow Site	**Louisiana Operations**	Date	**February 29, 2012**
Project Name	**PSV Switch Installation**	Cost Eng.	**M. Dugas**
Project No./Auth.No.		Proj.Mngr.	**Don Eure**
Auth. Date	**April 1, 2012**	Proj.Eng.	
RTO Date	**May 1, 2012**	Plant	

Dow Furnished Material						
3000	Civil/Steel					
4000	Piping Materials					
6000	Instruments					$4,142
7000	Electrical					
8000	Local Orders	0.0% of DFM				
9000	Major Equipment	0.0% included for spare parts				
	DFM total					**$4,142**
Contracts		Manhrs	Labor	Material		
	Major Equipment					
	Civil					
	Steel					
	Piping					
	Instrumentation	37	$2,062	$253		$2,315
	Electrical	123	$7,244	$1,315		$8,559
	Insulation					
	Paint					
	Scaffolding		$900			$900
	Demolition					
	Equipment Rental			$2,048		$2,048
	Overtime Premium					
	Winter Work (Labor Only)					
1000	**Contracts total**	160				**$13,822**
Indirects		% of estimate				
2100	Project Management	2.5%				$872
2200	Process Engineering					
2300	Process Control Engineering					
2400	Design Engineering	14.2%				$4,920
2500	Procurement	0.3%				$109
2600	Construction Management	5.0%				$1,736
2700	Business Direct Engineering					
2800	Outside Engineering					
2900	Miscellaneous	3.8%				$1,326
	Indirects total	25.9%				**$8,964**
Special Items						
3100	Taxes & Fees	9.0%				$698
3200	Inspection & Testing					
8600	Freight	1.0%				$57
	Special Items total					**$755**
Subtotal	Direct, Indirect and Special Items					**$27,683**
3700	Contingency				24.8%	$6,860
3800	Cost Trend				03.0% /yr	
Total						**$34,543**
669000	Capitalized Interest				06.6% /yr	$457
Amount Requested for Capital					$USD	**$35,000**
	Exchange Rate:				$ US	
	Expense Cost					$2,833
Total Expense						**$2,833**

Estimate Accuracy - Planning

Range	high +	35%	$USD	$47,250
	low -	25%	$USD	$26,250
Estimate Probability		60%	CEI	5.62

Signatures

Project Eng.________________ Date______________ Project Manager________________ Date______________

EXHIBIT VIIIc
List of Calculation Spreadsheets for Dow Chemical Corporation
Cost Estimate for Wired PSV System
With Installation of an Additional Junction Box

(submitted in the enclosed CD)

PSV Switch Installation Summary.xlsx

Dow Chemical Corporation Cost Estimate for Wired PSV System Without Installation of an Additional Junction Box

Project Cost Estimate Summary Report

Global Project Controls

Rev. 1.30

Dow Site	Louisiana Operations	Date	February 29, 2012
Project Name	PSV Switch Installation	Cost Eng.	M. Dugas
Project No./Auth.No.		Proj.Mngr.	Don Eure
Auth. Date	April 1, 2012	Proj.Eng.	
RTO Date	May 1, 2012	Plant	

Dow Furnished Material

3000	Civil/Steel		
4000	Piping Materials		
6000	Instruments		$540
7000	Electrical		
8000	Local Orders	0.0% of DFM	
9000	Major Equipment	0.0% included for spare parts	
	DFM total		$540

Contracts

	Manhrs	Labor	Material	
Major Equipment				
Civil				
Steel				
Piping				
Instrumentation	21	$1,165	$185	$1,350
Electrical	68	$4,041	$932	$4,973
Insulation				
Paint				
Scaffolding		$900		$900
Demolition				
Equipment Rental			$1,146	$1,146
Overtime Premium				
Winter Work (Labor Only)				
1000 Contracts total	89			$8,369

Indirects

		% of estimate	
2100	Project Management	4.7%	$872
2200	Process Engineering		
2300	Process Control Engineering		
2400	Design Engineering	13.4%	$2,521
2500	Procurement	0.6%	$109
2600	Construction Management	5.5%	$1,033
2700	Business Direct Engineering		
2800	Outside Engineering		
2900	Miscellaneous	4.6%	$871
	Indirects total	28.8%	$5,407

Special Items

3100	Taxes & Fees	9.0%	$252
3200	Inspection & Testing		
8600	Freight	1.0%	$17
	Special Items total		$269

Subtotal

	Direct, Indirect and Special Items		$14,585
3700	Contingency	28.6%	$4,174
3800	Cost Trend	03.0% /yr	

Total

			$18,759
669000	Capitalized Interest	06.6% /yr	$241

Amount Requested for Capital

Amount Requested for Capital	$USD	$19,000
Exchange Rate:	$ US	
Expense Cost		$2,833
Total Expense		$2,833

Estimate Accuracy - Planning

Range high +	35%	$USD	$25,650
low -	25%	$USD	$14,250
Estimate Probability	60%	CEI	10.52

Signatures

Project Eng.__________________ Date________________ Project Manager__________________ Date______________

EXHIBIT VIIIc
List of Calculation Spreadsheets for Dow Chemical Corporation
Cost Estimate for Wired PSV System
Without Installation of an Additional Junction Box

(submitted in the enclosed CD)

PSV Switch Installation Summary no JB.xls