

Fact Sheet



*For Final Permitting Action Under 45CSR30 and
Title V of the Clean Air Act*

Permit Number: **R30-03900005-2006**
Title V Application Received: **October 7, 1996**
Plant Identification Number: **03900005**
Permittee: **Union Carbide Corporation**
Facility Name: **Institute Plant**
Business Unit: **Water Soluble Polymers (Group 5 of 5)**
Mailing Address: **P. O. Box 8361, South Charleston, WV 25303**

Physical Location: Institute, Kanawha County, West Virginia
UTM Coordinates: 432.00 km Easting • 4,284.31 km Northing • Zone 17
Directions: From I-64, take the Institute exit, turn right onto State Route 25. Plant is located about ½ mile west on Route 25.

Facility Description

Union Carbide Corporation has divided their Title V Application into the following five separate business units for which each will receive a Title V Permit:

Group	Process Units
1 of 5	EO Catalyst/Glycol Recovery
2 of 5	Acetone Derivatives/TONE [®] Polyol
3 of 5	Logistics
4 of 5	Glutaraldehyde
5 of 5	Water Soluble Polymers

Group 5 of 5 includes the CELLOSIZ[®] HEC and POLYOX[®] WSR Plants. CELLOSIZ[®] Hydroxyethyl Cellulose (HEC) is a water soluble polymer used in architectural coatings, latex polymerization, oil field applications, building products, and personal care products. POLYOX[®] WSR is a water soluble resin used in the pharmaceutical industry, personal care industry, and the paper industry.

Emissions Summary

Water Soluble Polymers (Group 5 of 5) Emissions Summary [Tons per Year]		
Criteria Pollutants	Potential Emissions	2004 Actual Emissions
Carbon Monoxide (CO)	16.40	2.84
Nitrogen Oxides (NO _x)	3.01	0.05
Particulate Matter (PM ₁₀)	8.60	6.34
Total Particulate Matter (TSP)	8.60	6.34
Sulfur Dioxide (SO ₂)	1.86	Negligible
Volatile Organic Compounds (VOC)	676	645

PM₁₀ is a component of TSP.

Hazardous Air Pollutants	Potential Emissions	2004 Actual Emissions
Acetaldehyde	0.01	0.00
Acetonitrile	0.10	0.04
Ethylene Glycol	0.57	0.26
Ethylene Oxide	6.33	1.63
Isophorone	0.24	0.02

Some of the above HAPs may be counted as PM or VOCs.

Title V Program Applicability Basis

Due to the facility-wide potential to emit over 100 tons per year of criteria pollutants, over 10 tons per year of an individual HAP, and over 25 tons per year aggregate HAPs, Union Carbide Corporation’s Institute Plant is required to have an operating permit pursuant to Title V of the Federal Clean Air Act as amended and 45CSR30.

Legal and Factual Basis for Permit Conditions

The State and Federally-enforceable conditions of the Title V Operating Permits are based upon the requirements of the State of West Virginia Operating Permit Rule 45CSR30 for the purposes of Title V of the Federal Clean Air Act and the underlying applicable requirements in other state and federal rules.

Group 5 of 5 has been found to be subject to the following applicable rules:

Federal and State:	45CSR6	Open burning prohibited.
	45CSR7	Particulate matter and opacity limits for manufacturing sources.
	45CSR11	Standby plans for emergency episodes.
	45CSR13	Preconstruction permits for minor sources.
	WV Code § 22-5-4 (a) (14)	The Secretary can request any pertinent information such as annual emission inventory reporting.
	45CSR30	Operating permit requirement.

	45CSR34	Emission Standards for Hazardous Air Pollutants Pursuant to 40 C.F.R. Part 63.
	40 C.F.R. Part 61	Asbestos inspection and removal
	40 C.F.R. Part 63, Subpart PPP	Polyether Polyols MACT
	40 C.F.R. Part 63, Subpart UUUU	Cellulose Products Manufacturing MACT
	40 C.F.R. Part 82, Subpart F	Ozone depleting substances
State Only:	45CSR4	No objectionable odors.
	45CSR§§21-37 and 40	Control of VOC Emissions
	45CSR27	Best Available Technology (BAT) for HAPs

Each State and Federally-enforceable condition of the draft Title V Operating Permit references the specific relevant requirements of 45CSR30 or the applicable requirement upon which it is based. Any condition of the draft Title V permit that is enforceable by the State but is not Federally-enforceable is identified in the draft Title V permit as such.

The Secretary's authority to require standards under 40 C.F.R. Part 60 (NSPS), 40 C.F.R. Part 61 (NESHAPs), and 40 C.F.R. Part 63 (NESHAPs MACT) is provided in West Virginia Code §§ 22-5-1 *et seq.*, 45CSR16, 45CSR15, 45CSR34 and 45CSR30.

Active Permits/Consent Orders for Group 3 of 5

Permit or Consent Order Number	Date of Issuance	Permit Determinations or Amendments That Affect the Permit (if any)
R13-0171C	October 24, 2006	NA
CO-R21-97-41	October 20, 1997	June 14, 2006 letter from J. L. Blatt
CO-R27-99-14-A(92)	March 31, 1999	NA

Conditions from this facility's Rule 13 permit(s) governing construction-related specifications and timing requirements will not be included in the Title V Operating Permit but will remain independently enforceable under the applicable Rule 13 permit(s). All other conditions from this facility's Rule 13 permit(s) governing the source's operation and compliance have been incorporated into this Title V permit in accordance with the "General Requirement Comparison Table B," which may be downloaded from DAQ's website.

Determinations and Justifications

CELLOSIZE® HEC Plant

R13-0171C Requirements

4.1.12 provides emission limits for emission points 211A, 211L, 211LL, 216G, 216H, and 216I. Emissions from emission point 211A are controlled by the packed bed water scrubbers (A211 and A211A). These scrubbers are the method used to comply with the process vent provisions of 40 C.F.R. 63, Subpart UUUU and are subject to the monitoring, recordkeeping, and reporting requirements of 40 C.F.R. 63, Subpart UUUU. Since the MACT standard already requires monitoring, recordkeeping, and reporting of the control device and closed vent header system, no additional monitoring, recordkeeping, or reporting was added.

Emission point 211LL has hourly PM and PM₁₀ emission limits of 0.1 lb/hr and less than 0.01 tons per year. Because emissions from these sources are insignificant and emissions are controlled by Baghouse LL211 for which the permittee is required to conduct equipment inspections and preventative maintenance procedures and to maintain malfunction and maintenance records in accordance with 4.4.1 and 4.4.2, no additional monitoring, recordkeeping, or reporting was added.

To demonstrate compliance with the hourly and annual emission limits for emission points 216G, 216H, and 216I specified in 4.1.12, the permittee is required by 4.4.17 to maintain monthly records of throughput and to review these records to determine if the throughput from the previous 12 months would result in emissions within the 4.1.12 annual emission limits. These monthly records can also be reviewed to determine if the average hourly emissions are within the hourly emission limits.

Vessel 21101 vents to either the scrubbers (A211 or A211A) or to emission point 211L. Emissions from emission point 211L are batch emission events from a vessel charging operation. Since the 4.1.12 emission limits for emission point 211L are 0.22 lbs/hr and 0.36 tons/yr of VOC and 0.01 lbs/hr and 0.01 tons/yr of ethylene oxide, these emissions were considered insignificant and no additional monitoring, recordkeeping, or reporting was added to demonstrate compliance.

4.1.14 provides emission limits for the MO Flare (A221). To demonstrate compliance with these emission limits, the permittee is required to maintain and operate the flare as specified in conditions 4.1.15, 4.1.16, 4.1.17, and 4.1.18. 4.1.15 requires the permittee to continuously operate the flare when VOCs and/or HAPs are present in the process header vent that is routed to the flare, 4.1.16 requires a minimum net heating value of 200 BTU/scf for the gas stream in the flare gas header, 4.1.17 limits the flare gas exit velocity to less than 60 feet per second, and 4.1.18 requires the installation of a monitoring device capable of continuously detecting that at least one pilot flame or the flare flame is present. Monitoring of the presence of either a pilot light or flare flame while VOCs and HAPs are present in the process header routed to the flare is specified in 4.2.3. Condition 4.2.4 requires the permittee to monitor and record on a daily basis, the natural gas flow rate to the flare. Records of the monitoring required under 4.2.3 and 4.2.4 are required to be maintained in accordance with 3.4.2.

Emission limits for emission points 221B, 226A, 226C, and 226D are specified in 4.1.20. To demonstrate compliance with these annual emission limits, the permittee is required by 4.4.6 to maintain monthly records of throughput by tank and to review these records and determine if the number of turnovers made within the previous 12 months by tank would result in emissions within the annual limits stated in 4.1.20.

Hourly emission limits for emission point 221B are provided in 4.1.21. To demonstrate compliance with these limits, the permittee is required to route emissions from Tanks 1910 and 1915 to a condenser at all times when the vessel is in service and to operate the condenser in such a manner that it has a recovery efficiency of no less than 50%. Maintenance and malfunction records of the condenser are required to be maintained as specified in 4.4.1 and 4.4.2.

Emissions from the tanker truck rack (L2B) are limited by 4.1.22 to 0.13 tons per year. To demonstrate compliance with this annual limit, the permittee is required by 4.4.16 to maintain monthly throughput records and to review these records and determine if the throughput from the previous 12 months would result in emissions within the 4.1.22 annual limit for L2B.

Condition 4.1.23 provides PM and PM₁₀ hourly and annual emission limits for emission points 211C, 211D, 211E, 211N, 211O, 211P, 211R, 211S, 211T, 211U, 211V, 211W, 211X, 211Y, 211Z, 211AA, 211BB, 211CC, 211DD, 211EE, 211FF, 211J, 211K, 211Q, and 211GG. The emissions from these emission sources are controlled by baghouses. Based on the potential to emit of PM and PM₁₀ for these emission points and also that emissions are controlled by baghouses, R13-0171C required the permittee to demonstrate compliance through the use of equipment inspections, a preventative maintenance program, and the visible emission checks used to demonstrate compliance with 45CSR§7-3.1. Records of maintenance and malfunction for the baghouses are required under 4.4.1 and 4.4.2. Monitoring and recordkeeping requirements for the visible emission checks are specified in 4.2.6 and 4.4.18.

To demonstrate compliance with the hourly and annual ethylene oxide and VOC emission limits for emission points 211C, 211D, 211E, 211N, 211O, 211P, 211R, 211S, 211T, 211U, 211V, 211W, 211X, 211Y, 211Z, 211AA, 211BB, 211CC, 211DD, 211EE, 211FF and the hourly and annual VOC emission limits for 216A, 216E, 216F, and 216D provided in 4.1.23, the permittee is required by 4.4.7 to maintain monthly records of throughput by tank and to review these records to determine if the throughput from the previous 12 months would result in emissions within the 4.1.23 emission limits.

40 C.F.R. 63, Subpart UUUU Requirements

Process Vents

The CELLOSIZE[®] HEC Plant is subject to 40 C.F.R. 63, Subpart UUUU and is required to reduce the total uncontrolled organic HAP emissions by at least 99% by operating and maintaining a packed bed scrubber (A211 or A211A) and using the extended cookout practice as specified in 4.1.4. Emissions to the scrubber shall be routed through the header system which must be maintained as a closed-vent system in accordance with 4.1.2.

To demonstrate compliance with the requirements of 4.1.4, the permittee is required by 4.1.5 and 4.2.1 to install, maintain, and operate devices to continuously measure the scrubbing liquid flow rate, the pressure drop across the packed bed water scrubber, and the scrubber water temperature. The daily average scrubber water flow rate shall be equal to or greater than 5,000 pounds per hour, the daily average pressure drop of the scrubber shall be no greater than 40 inches of water, and the daily average maximum scrubber water temperature shall not exceed 25 °C. The permittee is also required by 4.2.2 to install and maintain a system or procedure that notifies or alerts the onsite operator at least on a daily basis any deviation of the monitored scrubber parameters from the values provided in 4.1.4. The extended cookout records and records of the monitored parameters shall be maintained as specified in 4.4.3.

To demonstrate compliance with the requirements of 4.1.2 that the header system identified as 211KK be operated and maintained as a closed-vent system, the permittee is required by 4.1.3 to conduct annual visual inspections and repair detected leaks of the scrubber system.

The permittee is required under 4.5.3 to submit a semi-annual compliance report addressing any deviations from applicable emissions limitations and the work practice standards as defined in 40 C.F.R. §63.5505(a) during each reporting period.

Storage Vessels

There are no storage vessels subject to 40 C.F.R. 63, Subpart UUUU.

Wastewater

CELLO-80S and MOU-0001 are Group 2 process wastewater streams and are required to maintain records in accordance with 4.4.12. There are no Group 1 process wastewater streams subject to 40 C.F.R. 63, Subpart UUUU.

Heat Exchanger Systems

The heat exchanger systems are once through heat exchangers that are covered under a National Pollution Discharge Elimination System (NPDES) permit that meet the requirements set forth in 40 C.F.R. §63.104(a)(4) and are therefore not required to conduct any additional monitoring, recordkeeping, or reporting.

Maintenance Wastewater

For maintenance wastewater, the permittee is required to comply with the requirements of 4.1.10 and 4.4.13 by preparing a description of maintenance procedures and implementing them as part of the start-up, shutdown, and malfunction plan required under 40 C.F.R. §63.6(e)(3).

Equipment Leaks

The CELLOSIZE[®] HEC Plant must comply with the equipment leak provisions of 40 C.F.R. 63, Subpart H – “National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks.” Equipment components in the CELLOSIZE[®] HEC Plant are subject to the following provisions: 40 C.F.R. §§63.162 (Standards: General), 63.167 (Standards: Open-ended valves or lines), 63.168 (Standards: Valves in gas/vapor service and in light liquid service), 63.171 (Standards: Delay of repair), 63.172 (Standards: Closed-vent systems and control devices), and 63.174 (Standards: Connectors in gas/vapor service and in light liquid service). Testing, recordkeeping, and reporting requirements to demonstrate compliance with the applicable leak standards specified in 4.1.11 are provided in 4.3.4 (40 C.F.R. §63.180 – Test methods and procedures), 4.4.14 (40 C.F.R. §63.181 – Recordkeeping requirements), and 4.5.6 (40 C.F.R. §63.182 – Reporting requirements).

45CSR6 Requirements

The permittee is required to comply with the hourly particulate matter emission limits of 45CSR§6-4.1 for the MO Flare A221. The 45CSR§6-4.1 limit for the flare is based on the incinerator capacity. Compliance with the 4.1.14 hourly PM emission limit for the MO Flare A221 shall demonstrate compliance with the less stringent 45CSR§6-4.1 hourly particulate matter emission limit.

45CSR§6-4.3 limits the opacity from the MO Flare A221 to less than twenty (20%) percent. In order to demonstrate compliance with this limit, the permittee is required by 4.2.5 to conduct monthly visual emissions monitoring and to maintain records in accordance with 4.4.5.

45CSR7 Requirements

Emissions from emission points 211LL, 211C, 211D, 211E, 211J, 211K, 211N, 211O, 211P, 211Q, 211EE, 211FF, and 211GG are required by 45CSR§7-3.1 to be maintained at or below twenty percent opacity. For emission point 211LL, the permittee is required by 4.1.13 to demonstrate compliance with the twenty percent opacity limit through equipment inspections and preventative maintenance procedures. Malfunction and maintenance records of air pollution control equipment are required under 4.4.1 and 4.4.2.

For emission points 211C, 211D, 211E, 211J, 211K, 211N, 211O, 211P, 211Q, 211EE, 211FF, and 211GG, the permittee is required to conduct visible emission checks in accordance with 4.2.6. The visible emission checks shall be conducted at least once per calendar month. If no visible emissions are detected for three consecutive months, the checks may be conducted quarterly. If visible emissions are observed during the quarterly observations, then monthly readings must be implemented again until the permittee has three consecutive months of no visible emissions. Records of these visible emission checks are required to be maintained as specified in 4.4.18. In addition to visible emission checks, the permittee is also required by 4.4.1 and 4.4.2 to maintain maintenance and malfunction records for baghouses C211, D211, E211, J211, K211, N211, O211, P211, Q211, EE211, FF211, and GG211 used to control emissions from emission points 211C, 211D, 211E, 211J, 211K, 211N, 211O, 211P, 211Q, 211EE, 211FF, and 211GG.

In accordance with 45CSR§7-3.7, there shall be no visible emissions from emission points 211R, 211S, 211T, 211U, 211V, 211W, 211X, 211Y, 211Z, 211AA, 211BB, 211CC, and 211DD. To demonstrate compliance with this condition, the permittee is required to conduct visible emission checks in accordance with 4.2.6. Records of the visible emission checks shall be maintained in accordance with 4.4.18.

Emission points 211LL, 211C, 211D, 211E, 211N, 211O, 211P, 211R, 211S, 211T, 211U, 211V, 211W, 211X, 211Y, 211Z, 211AA, 211BB, 211CC, 211DD, 211EE, 211FF, 211J, 211K, 211Q, and 211GG are subject to the particulate matter emission limits of 45CSR§7-4.1. Emission limits are calculated from Table 45-7A based on the maximum hourly process weight rate for the appropriate source category. Compliance with the 45CSR§7-4.1 hourly particulate matter emission limits shall be demonstrated through compliance with the more stringent 4.1.12 and 4.1.23 hourly particulate matter emission limits.

In order to demonstrate compliance with the requirements of 3.1.9 (45CSR§7-5.2), fugitive emissions from plant premises under the operating control of UCC are minimized through paving and/or gravel.

45CSR21 Requirements

The permittee is subject to the state-enforceable only emission limitation requirements from 45CSR§21-40 and Consent Order CO-R21-97-41. According to Condition 2.4.2 of R13-0171C, the state-enforceable only hourly and annual emission limits provided in Attachment A of Consent Order CO-R21-97-41 were superseded and replaced by the hourly and annual emission limits provided in 4.1.12, 4.1.14, 4.1.20, 4.1.21, and 4.1.23 for emission points 216E, 261F, 211A, 216A, 221B, 216D, and 221A.

The state-enforceable only leak detection and repair (LDAR) requirements from 45CSR§21-37 and Consent Order CO-R21-97-41 were not superseded and replaced and are provided in 4.1.27, 4.3.5, 4.4.15, and 4.5.7.

45CSR27 Requirements

The permittee is subject to the state-enforceable only emission limitation requirements from 45CSR§27-3.1 and Consent Order CO-R27-99-14-A(92) for the CELLOSIZ[®] HEC Plant. According to Condition 2.4.2 of R13-0171C, the state-enforceable only hourly and annual ethylene oxide emission limits provided in the consent order were superseded and replaced by the hourly and annual ethylene oxide emission limits provided in 4.1.12 and 4.1.23.

The leak detection and repair (LDAR) requirements from 40 C.F.R. 63, Subpart H are provided in 4.1.11, 4.3.4, 4.4.14, and 4.5.6.

Attachment B of Consent Order CO-R27-99-14-A(92) had fugitive ethylene oxide emissions for involved equipment in the CELLOSIZ[®] HEC Plant. These emissions were not included as limits in the Title V permit based on a letter dated August 24, 2000 from Rick Atkinson and G. Dale Farley of the DAQ which states that such emissions from the consent order are not a numerical value limit and are only used for understanding the potential size of emissions and as a measuring stick to judge how the LDAR program is performing.

POLYOX[®] WSR Plant

40 C.F.R. 63, Subpart PPP Requirements

Process Vents

Emission Units V302, V404, V518, V4921, and V4922 are Group 1 process vents and are required by 5.1.1 to reduce emissions of organic HAP using a flare. Emissions from this source are routed to Flare A221 (emission point 221A).

To demonstrate compliance with 5.1.1, 5.2.1 requires the installation of a device to continuously detect the presence of a pilot flame. The data submitted as part of the Notification of Compliance Status Report is required to be maintained in accordance with 5.4.1. Ongoing recordkeeping and reporting to demonstrate compliance with 5.1.1 is provided in 5.4.2 and 5.5.3. 5.4.2 requires the permittee to maintain hourly records of whether the monitor was continuously operating and whether the pilot flame was continuously present during each hour, and records of the times and durations of all periods during which all pilot flames are absent or the monitor is not operating. The records specified in 5.4.2 are required to be submitted as part of the Periodic Reports specified under 5.5.3.

There are no Group 2 process vents in the POLYOX[®] WSR Plant.

Storage Vessels

There are no Group 1 or 2 storage vessels in the POLYOX[®] WSR Plant.

Transfer Operations

There are no Group 1 or Group 2 transfer operations in the POLYOX[®] WSR Plant.

Process Wastewater

Vessel 401 Tails is a Group 1 process wastewater stream and is required by 5.1.2 to reduce the mass flow rate of ethylene oxide by a 0.98 fraction removal (Fr). To demonstrate compliance with this limit, 5.2.2 requires the permittee to continuously monitor the reactor temperature, caustic feed flow, and extractor tails water feed flow for the C-461 Reactor. Temperature will be monitored by a thermocouple, and flowmeters will be used to monitor caustic flow and feed flow. A flow ratio controller will use a prescribed set point to adjust the caustic flow based on changes in the feed flow in order to maintain the proper ratio to ensure the required 98% destruction. A computer control system will store the monitoring data with readings taken at the proper frequency to ensure continuous monitoring. The parameter monitoring levels were established via a performance curve of temperature versus caustic flow/feed flow ratio to maintain the required destruction percentage and an engineering assessment was conducted based on reactor geometry, high flow conditions, and first order reaction kinetics to generate the performance curve. The parameter monitoring levels and performance curve were submitted by letter dated August 16, 2002. Union Carbide requested these alternative monitoring parameters for the C-461 Reactor and they were approved by EPA. Records of the reactor temperature, caustic feed flow, and extractor tails water feed flow are required by 5.4.3 to be stored on a computer control system. The monitoring results for each operating day during which the monitored parameters were outside the range established in 5.2.2 are required by 5.5.4 to be submitted as part of the next Periodic Report required by 40 C.F.R. §63.1439(e)(6).

The Tank 4929 Discharge to Sewer and Scrubber 230 Tails (B230) are Group 2 process wastewater streams and the permittee is required to maintain records in accordance with 5.4.4.

Heat Exchanger Systems

The POLYOX[®] WSR Plant operates two heat exchangers for cooling process fluids that contain 5% or more HAPs. Since the heat exchanger systems meet the conditions of either 40 C.F.R. §§63.104(a)(1) {operated with the minimum pressure on the cooling water side at least 35 kilopascals greater than the maximum pressure on the process side}, or 63.104(a)(4) {the once-through heat exchange system is subject to an NPDES permit}, no additional monitoring, recordkeeping, or reporting is required to be conducted.

Maintenance Wastewater

For maintenance wastewater, the permittee is required to comply with the requirements of 5.1.4 and 5.4.5 by preparing a description of maintenance procedures and implementing them as part of the start-up, shutdown, and malfunction plan required under 40 C.F.R. §63.6(e)(3).

Equipment Leaks

The POLYOX[®] WSR Plant is subject to the equipment leak provisions of 40 C.F.R. 63, Subpart H – “National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks,” except as specified in 40 C.F.R. §§63.1434(b) through (g). Equipment components in the POLYOX[®] WSR Plant are subject to 40 C.F.R. §§63.162 (Standards: General), 63.168 (Standards: Valves in gas/vapor service and in light liquid service), 63.171 (Standards: Delay of repair), 63.172 (Standards: Closed-vent systems and control devices), 63.173 (Standards: Agitators in gas/vapor service and in light liquid service), and 63.174 (Standards: Connectors in gas/vapor service and in light liquid service). Testing, recordkeeping, and reporting requirements to demonstrate compliance with the applicable leak standards specified in 5.1.5 are provided in 5.3.1 (40 C.F.R. §63.180 – Test methods and procedures), 5.4.6 (40 C.F.R. §63.181 – Recordkeeping requirements), and 5.5.5 (40 C.F.R. §63.182 – Reporting requirements).

45CSR6 Requirements

Flare A221 is shared with the CELLOSIZ[®] HEC Plant. A discussion of the 45CSR6 applicable requirements for this flare is provided in the CELLOSIZ[®] HEC Plant Section.

45CSR7 Requirements

Emissions from emission points 230GG, 230J, and 230P are required by 45CSR§7-3.1 to be maintained at or below twenty percent opacity. Since particulate matter emissions from these sources result primarily from displacement of air or nitrogen from containers or vessels during material transfers and these sources are equipped with baghouses or filters to provide nuisance dust control, visible emission observations were not required. To demonstrate compliance with the visible emission limits, the permittee is required to conduct preventative maintenance on these control devices and to maintain malfunction and maintenance records as specified in 5.4.7 and 5.4.8.

Emission points 230GG, 230J, and 230P are also subject to the particulate matter emission limits of 45CSR§7-4.1. Emission limits are calculated from Table 45-7A based on the maximum hourly process weight rate for a type ‘a’ source. The following table compares the 45CSR§7-4.1 allowable particulate emission limits with the maximum actual hourly emissions. Because emissions from these sources are controlled with baghouses or filters and actual emissions from each of these sources are less than 0.1 lbs/hr and are much less than 45CSR§7-4.1 allowable emission limit, the permittee will demonstrate compliance with these limits through preventative maintenance of their control equipment. Malfunction and maintenance records for the baghouses and filter are required under 5.4.7 and 5.4.8.

Emission Point	Emission Source	45CSR§7-4.1 PM Emission Limit lb/hr	Maximum Actual Emissions lb/hr
230GG	230B	0.7	0.015
230J	E-707	10	0.032
230P	E-504	25	0.083

The House Vacuum System (Emission Source E535, Emission Point 230V) is subject to the fugitive emission limitations of 45CSR§7-5.1 as specified in 5.1.10. Since emissions from this fugitive particulate matter emission source are controlled by Baghouse E535, compliance will be demonstrated through preventative maintenance on the baghouse. Maintenance and malfunction records for the baghouse are required under conditions 5.4.7 and 5.4.8.

In order to demonstrate compliance with the requirements of 3.1.9 (45CSR§7-5.2), fugitive emissions from plant premises under the operating control of UCC are minimized through paving and/or gravel.

45CSR21 Requirements

The permittee is subject to the state-enforceable only emission limitation requirements from 45CSR§21-40 and Consent Order CO-R21-97-41 provided in 5.1.12 and the state-enforceable only leak detection and repair (LDAR) requirements from 45CSR§21-37 and Consent Order CO-R21-97-41 provided in 5.1.13, 5.3.6, 5.4.9, and 5.5.6. The specific hourly, daily, and annual emission limits from Consent Order CO-R21-97-41 for the POLYOX® WSR Plant are provided in Appendix A, Attachment A of the permit.

45CSR27 Requirements

The permittee is subject to the state-enforceable only emission limitation requirements from 45CSR§27-3.1 and Consent Order CO-R27-99-14-A(92) for the POLYOX® WSR Plant provided in 5.1.14 and the leak detection and repair (LDAR) requirements from 40 C.F.R. 63, Subpart H provided in 5.1.5, 5.3.1, 5.4.6, and 5.5.5.

Since Emission Point 221A is already subject to the requirements of 40 C.F.R. 63, Subpart PPP for Flare A221 because it is used to comply with the Group 1 process vent provisions for V302, V404, V518, V4921, and V4922, no additional monitoring, testing, recordkeeping, or reporting was added to demonstrate compliance with the 45CSR27 hourly and annual ethylene oxide emission limits from Consent Order CO-R27-99-14-A(92).

For the POLYOX® Solids Handling System consisting of emission points 230K, 230L, 230M, 230N, 230P, 230R, 230II, 230J, and 230V the permittee is required to demonstrate compliance with the hourly ethylene oxide emission limits from Consent Order CO-R27-99-14-A(92) by setting the rotary valve speed on the solids handling system at no greater than 3 revolutions per second and by conducting annual checks on the rotary valve speed and making

adjustments if necessary. Since emissions from the system result primarily from the venting of process inerting gas to the atmosphere and the amount of gas released is a function of the polymer transfer rate, controlling the amount of polymer transferred will limit the amount of inerting gas vented to the atmosphere, thereby controlling emissions of ethylene oxide. To demonstrate compliance with the annual emission limits, the permittee will be required to maintain production records and shall calculate the twelve month rolling total ethylene oxide emissions upon the request of the Director.

To demonstrate compliance with the annual ethylene oxide emission limits for emission points 230O, 230Q, 230T, 230CC, and 230HH, the permittee is required by 5.4.12 to maintain records for each emission point showing the total number of emitting events occurring during the past month. Upon the request of the Director, these records shall be used to calculate a twelve month rolling total annual ethylene oxide emission rate for each emission point. For emission points 230O and 230T, the permittee will also maintain records of the duration of each emitting event. The amount of material vented per event, and the duration of each event may be used to calculate an hourly emission rate.

Emissions from emission point 230Q result from pump priming during some process unit startups. Since the 5.1.14 hourly and annual ethylene oxide emission limits for emission point 230Q are 0.2 lbs/hr and 2 lbs/yr, these emissions were considered insignificant and no method to demonstrate compliance with the hourly emission limit was added. The permittee will only be required to maintain records to demonstrate compliance with the annual emission limit.

Although the 5.1.14 ethylene oxide emission limit for emission point 230CC is 7.7 lbs/hr, the annual emission limit is only 6 lbs/yr which seems to indicate that the actual hourly rate is not nearly as high as the limit. Since the annual emissions are only 6 lbs/yr, the permittee was only required to maintain records of the number of emitting events and to calculate the annual emissions upon request.

Since the 5.1.14 hourly ethylene oxide emission limit for 230HH is only 0.8 lbs/hr and compliance with the annual ethylene oxide emission limit of 45 lbs/year is already being demonstrated through monthly records of the number of emitting events, no additional monitoring, recordkeeping, or reporting was added to demonstrate compliance with the hourly ethylene oxide emission limit.

Emissions from Vessel 4903 (emission point 230B) are controlled by a scrubber. Operation of Vessel 4903 is interlocked to prevent operation if the water flow rate to the scrubber is less than 25 gallons per minute. To demonstrate compliance with the hourly and annual propylene oxide emission limits for emission point 230B, the permittee is required to maintain records of the scrubber water flow meter calibrations and records of the functionality checks conducted on the scrubber interlock system. These recordkeeping requirements are provided in 5.4.13.

Compliance with the annual propylene oxide emission limit for Vessel 4901 (emission point 230S) will be demonstrated by maintaining records of the date and material throughput as specified in 5.4.14. These records may be used to calculate a twelve month rolling total propylene oxide emission rate to demonstrate compliance with the annual emission limits. Hourly emissions occur as the result of filling the vessel. Since Vessel 4901 is filled with material received from cylinders, the amount of material transferred per event is small and hourly emissions were considered insignificant, so no monitoring, recordkeeping, or reporting was added to demonstrate compliance with the 5.1.14 hourly emission limits.

Emission points 235E and 230AA are for emissions from wastewater. Emission point 235E is subject to the Group 2 process wastewater recordkeeping requirements of 40 C.F.R. 63, Subpart PPP, so no additional monitoring, recordkeeping, or reporting was added to demonstrate compliance with the 5.1.14 hourly and annual ethylene oxide emission limits. Emission point 230AA is exempt from the wastewater provisions of 40 C.F.R. 63, Subpart PPP and since its 5.1.14 allowable emissions are 1.2 lbs/hr and 2 lbs/yr of ethylene oxide, emissions from this emission point were considered insignificant and no monitoring, recordkeeping, or reporting was added to demonstrate compliance with the 5.1.14 hourly and annual emission limits.

A method of demonstrating compliance with the hourly and annual ethylene oxide emission limits from Vessel 4992 (emission point 235H) and the secondary emissions from Vessel 4992 was not included in the Title V permit because the wastewater stream that went to Vessel 4992 is now treated by the C-461 (PEPO) Reactor which is used to comply with the Group 1 process wastewater provisions of 40 C.F.R. 63, Subpart PPP and is already subject to MACT monitoring recordkeeping, and reporting.

Attachment B of Consent Order CO-R27-99-14-A(92) had fugitive ethylene oxide and propylene oxide emissions for involved equipment in the POLYOX[®] WSR Plant. These emissions were not included as limits in the Title V permit based on a letter dated August 24, 2000 from Rick Atkinson and G. Dale Farley of the DAQ which states that such emissions from the consent order are not a numerical value limit and are only used for understanding the potential size of emissions and as a measuring stick to judge how the LDAR program is performing.

Non-Applicability Determinations

The following requirements have been determined not to be applicable to the subject facility due to the following:

- a. 40 C.F.R. 63, Subpart EEEE – “National Emission Standards for Hazardous Air Pollutants: Organic Liquid Distribution (Non-Gasoline).” For the CELLLOSIZE[®] HEC Plant, tanks T1912, T1913, and T1921 are used to store an organic liquid containing HAPs and Tank Truck Rack L2B is used to load an organic liquid containing HAPs. These emission units are not subject to the requirements of 40 C.F.R. 63, Subpart EEEE for storage tanks and transfer racks because the liquid vapor pressure of the organic liquid stored and transferred is less than 0.1 psia. The POLYOX[®] WSR Plant is also not subject to the requirements of 40 C.F.R. 63, Subpart EEEE because the liquid vapor pressure of materials processed in the plant are also less than 0.1 psia.
- b. 40 C.F.R. 60, Subpart Kb – “Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984. Tank 5210 has a capacity less than 75 m³ and is therefore not subject to the requirements of 40 C.F.R. 60, Subpart Kb.

Request for Variances or Alternatives

None.

Insignificant Activities

Insignificant emission unit(s) and activities are identified in the Title V application.

Comment Period

Beginning Date: November 2, 2006
Ending Date: December 4, 2006

All written comments should be addressed to the following individual and office:

Carrie McCumbers
Title V Permit Writer
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street SE
Charleston, WV 25304

Procedure for Requesting Public Hearing

During the public comment period, any interested person may submit written comments on the draft permit and may request a public hearing, if no public hearing has already been scheduled. A request for public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. The Secretary shall grant such a request for a hearing if he/she concludes that a public hearing is appropriate. Any public hearing shall be held in the general area in which the facility is located.

Point of Contact

Carrie McCumbers
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone: 304/926-0499 ext. 1226 • Fax: 304/926-0478

Response to Comments (Statement of Basis)

Union Carbide Corporation provided two suggested changes to the draft Title V permit by letter dated December 1, 2006. These changes affected conditions 5.2.2.1 and 5.4.10. The suggested change to 5.2.2.1 was to add “extractor tails” to the following sentence in order to provide clarification: “Temperature will be monitored by a thermocouple, and flowmeters will be used to monitor caustic flow and extractor tails feed flow.” The comment concerning 5.4.10 was to correct a typographical error with the flare identification number as follows: “Recordkeeping Requirements for the Flare A221 ~~DMSCD01~~ are provided in 4.4.4 and 4.4.5.”