Simple

air contaminant discharge permit

Department of Environmental Quality

Eastern Region

475 NE Bellevue Dr., Suite 110

Bend, OR 97701

541-388-6146

This permit is being issued in accordance with the provisions of ORS 468A.040 and

based on the land use compatibility findings included in the permit record.

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| ISSUED TO:  ZeaChem Inc.  165 S Union Blvd., Suite 380  Lakewood, CO 80228 | INFORMATION RELIED UPON:  Application No.: 26299  Date Received: 07/19/11 |
| PLANT SITE LOCATION:  71099 Rail Loop Drive  Boardman, OR 97818 | LAND USE COMPATIBILITY FINDING:  Approving Authority: Morrow County  Approval Date: 10/23/09 |
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**ISSUED BY THE DEPARTMENT OF ENVIRONMENTAL QUALITY**

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Mark W. Bailey, Eastern Region Air Quality Manager Dated

Source(s) Permitted to Discharge Air Contaminants (OAR 340-216-0020):

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| **Table 1 Code** | **Source Description** | **SIC** |
| Part B, 57 | Organic or Inorganic Chemical Manufacturing and Distribution | 2869 |

**Addendum No. 1**

In accordance with OAR 340-216-0040, the following condition(s) now read as follows:

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| 2.2 Reserved | The requirements of 40 CFR 60, Subpart Dc are no longer applicable to this facility. |

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| Plant Site Emission Limits (PSEL) | Plant site emissions must not exceed the following: | | |
| **Pollutant** | **Limit** | **Units** |
| PM | 24 | tons per year |
| PM10 | 14 | tons per year |
| PM2.5 | 9 | tons per year |
| SO2 | 39 | tons per year |
| NOX | 39 | tons per year |
| CO | 99 | tons per year |
| VOC | 39 | tons per year |
| GHGs (CO2e) | 74,000 | tons per year |

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| Reserved | Testing requirements have been removed since expected emissions are minimal. |

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| Tank Emissions | The permittee must use the most recent version of EPA TANKs or equivalent AP-42 algorithm to calculate monthly emissions from the Extraction Column Feed Tank (T3910, Emission Point #12), Acidification Surge Tank (T4030, Emission Point #16), Concentrated Acetic Acid Day Tank (T5002, Emission Point #19) and Ethanol Day Tank (T5004, Emission Point #32). |

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| 5.1 Operation and Maintenance | d. Reserved. No longer required to keep records for compliance with 40 CFR 60, Subpart Dc. |

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| **6.3 Reserved** | No longer required to submit reports required by 40 CFR 60, Subpart Dc. |

# Emission Factors

| **Emissions Device or Activity** | **Pollutant** | | **Emission Factor (EF)** | **EF Units** | **EF Reference** |
| --- | --- | --- | --- | --- | --- |
| Live Bottom Bin – T1010 | VOC | | 1.57 | lb/BDT | Source Estimate |
| Filter Press – F1030 | VOC | | 0.595 | lb/BDT | Source Estimate |
| Lignin Dryer – F1060 | PM/PM10/PM2.5  VOC | | 0.1156  3.215 | lb/BDT | Source Estimate |
| Hydrolyzate Filter – F2000 | VOC | | 0.038 | lb/Mgal | Source Estimate |
| Media Dust Collector – D3110 | PM/PM10/PM2.5 | | 0.0135 | lb/hr | Source Estimate |
| Extraction Column Feed Tank – T3910, Acidification Surge Tank – T4030, Concentrated Acetic Acid Day Tank – T5002, Ethanol Day Tank – T5004 | VOC | | Use EPA TANKS software or AP-42 algorithm for 12-month emission calculation | | |
| Acidification Polishing Filter – F4020 | VOC | | 0.07 | lb/Mgal | Source Estimate |
| Cooling Tower – E9010 | PM  PM10/PM2.5 | | 0.035  0.016 | lb/Mgal  lb/Mgal | AP-42, Table 13.4-1, 2 |
| Boiler #1 – B9110 | PM/PM10/PM2.5  NOx  CO  VOC | | 7.6  100  84  5.5 | lb/MMft3 | AP-42, Table 1.4-2  AP-42, Table 1.4-1  AP-42, Table 1.4-1  AP-42, Table 1.4-2 |
| Boiler #2 – B9111 | PM/PM10/PM2.5  NOx  CO  VOC | | 7.6  100  84  5.5 | lb/MMft3 | AP-42, Table 1.4-2  AP-42, Table 1.4-1  AP-42, Table 1.4-1  AP-42, Table 1.4-2 |
| Thermal Oxidizer – X9610 | PM/PM10/PM2.5  NOx  CO  VOC | | 0.0164  0.237  0.295  0.0548 | lb/hr | Source Estimate |
| **Equipment Leak Fugitives** | | | | | |
| Valve – gas | | VOC | 0.0132 | lb/hr/source | EPA-453/R-95-017 Table 2-1 |
| Valve – light liquid | | 0.0089 |
| Pump seal – light liquid | | 0.044 |
| Pressure relief valves | | 0.229 |
| Connectors | | 0.004 |
| Open ended lines | | 0.0037 |
| Sampling connections | | 0.033 |

**Greenhouse Gases:**

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| **Device** | **Pollutant** | **Emission Factor** | | **Referemce\*** |
| Boilers | CO2e | 120,728 | lb/mmscf nat.gas | AP-42, Table 1.4-2 |
| Thermal oxidizer | CO2e | 117 | Lb/mmBtu nat. gas | EPA430-K-08-03 |

\*Sum of CO2, CH4, and N2O emissions factors after applying the global warming potential (GWP) factors. GWP = 1 for CO2; 21 for CH4, and 310 for N2O.

# Process/Production Records

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| **Emissions Device or Activity** | **Process or Production Parameter** | **Frequency** |
| Live Bottom Bin – T1010 | Bone dry tons of wood chips | Monthly |
| Filter Press – F1030 | Bone dry tons of wood chips | Monthly |
| Lignin Dryer – F1060 | Bone dry tons of wood chips | Monthly |
| Hydrolyzate Filter – F2000 | Gallons of neutralized hydrolyzate throughput | Monthly |
| Media Dust Collector – D3110 | Hours of operation | Monthly |
| Extraction Column Feed Tank – T3910, | Gallons throughput | Monthly |
| Acidification Surge Tank – T4030, | Gallons throughput | Monthly |
| Concentrated Acetic Acid Day Tank – T5002, | Gallons throughput | Monthly |
| Ethanol Day Tank – T5004 | Gallons throughput | Monthly |
| Acidification Polishing Filter – F4020 | Gallons throughput | Monthly |
| Cooling Tower – E9010 | Average water circulation flowrate (gallons/minute) | Monthly |
| Boiler #1 – B9110 | Million cubic feet of natural gas | Monthly |
| Boiler #2 – B9111 | Million cubic feet of natural gas | Monthly |
| Thermal Oxidizer – X9610 | Hours of operation | Monthly |
| Equipment Leak Fugitives | Number of pieces of applicable equipment in the stream | Monthly |