Sasol Chemicals

April 2021

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EO Emissions Testing Timeline

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July 2018

- Since 2018, when EPA released the results of its EPA National Air Toxics Assessment, we've had several discussions with LDEQ about Sasol's Louisiana ethylene oxide operations, permitting and continuous improvement emissions reduction program
- We committed to reviewing our historical emissions data to ensure its accuracy.

July 2019

- Commissioned Alliance Source Testing, LLC to conduct testing on VCU controls vents from the ETO process and EO storage/unloading and byproducts storage/loading.
- Results indicated DRE of 99.9% for EO, which meant an over reporting of EO emissions from 2014-18.

October 2019

- Worked with LDEQ to revise EO emissions data from 2014-18.

Year	EO Emissions from LCCC Site	EO Emissions from ETO VCU @ 98% DRE	EO Emissions from VCU adjusted for 99.9% DRE	Adjusted EO Emissions from LCCC Site	% Decrease
2014	6.323	5.542	0.277	1.057	83.3
2015	8.931	7.745	0.387	1.573	82.4
2016	7.372	6.994	0.350	0.727	90.1
2017	8.225	7.550	0.378	1.052	87.2
2018	8.381	7.644	0.382	1.119	86.7

EO Emissions Testing Overview

WHO: Alliance Source Testing, LLC

WHEN: July 16-17, 2019

WHAT: VCU-1034-2 Inlet & Outlet, LDEQ Title V Permit 2325-V7

Target Parameters: EO, DRE

VCU controls vents from the ETO process and EO storage/unloading and byproducts storage/loading.

RESULTS:

- Results indicated DRE of 99.9% for EO
- Site Specific Test Plan and complete test report available via LDEQ Public Records (EDMS)

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EO Permitting History

Ethoxylation Units (ETO)

- May 2014, LDEQ Title V Permit No. 2325-V5
  - Addition of 1.95 tpy for ETO Trains 4 & 5, installed as part of the facility expansion known as the Lake Charles Chemicals Project (LCCP).
  - Reached beneficial operation Jan. 2020
- Oct 2015, LDEQ Title V Permit No. 2325-V6
  - Correction of a transcription error in the application for the Loading Rack emissions, resulting in EO permit limit increase by +0.255 tpy
- Dec 2015, LDEQ Title V Permit No. 2325-V7
  - EO emissions not impacted
- Nov 2019, LDEQ Title V Permit No. 2325-V8
  - Permit Total decrease of -0.25 tpy EO due to reconciliations per final design of ETO Trains 4 & 5 among other changes to existing sources
    - Addition of West Lab Emissions as point source, 0.192 tpy EO. These emissions are associated with sampling activities in the new EOEG Unit.
    - Revised EO Railcar venting estimate to the existing Flare and/or VCU to reflect shorter event duration, include EO concentration in the calculation formula, and revised number of events
      - Created a cap for the existing flare and the VCU, which reflected in a decrease from 8.85 tpy (individual sum) to a cap of 8.786 tpy
    - Moved new ETO Trains 4 & 5 tanks into a tank farm, TF-3, individually were permitted for <0.01 tpy EO, but now capped at 0.087 tpy EO
    - Minor revisions in the new flare calcs for ETO 4&5 trains, permitting from <0.01 to 0.013 tpy EO
    - Minor revisions in existing (-0.282 tpy EO) and new fugitive emissions (+0.026 tpy EO) associated with a change in EO speciation.
- Future Permitting Updates
  - Incorporation of the 2019 VCU Testing for DRE and remove some operatgin hours that flare serves as backup based on new actual data, anticipated to reduce potential to emit (PTE) for the permit by ~ 3 tpy of EO.
  - West Lab emissions will be refined and reflect a decrease in EO estimates from sampling activities (decrease TBD).

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EO Permitting History

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Ethylene Oxide/Ethylene Glycol Unit (EOEG)

- May 2014, LDEQ Title V Permit No. 3115-V0
  - Addition of 3.36 tpy EO for the new Unit, installed as part of the facility expansion known as the Lake Charles Chemicals Project (LCCP).
  - Reached beneficial operation May 2019
- Sept 2018, LDEQ Title V Permit No. 3115-V1
  - Permit Total decrease of -0.18 tpy EO due to pre-construction reconciliations in Design from Feed to Final
    - Changes in Heat & Material Balance (HMB) associated with the Waste Heat Boiler, the Catalytic Combustion Unit, the Flare, and the Regenerator/Feed Flash Drums
- Jan 2019, LDEQ Title V Permit No. 3115-V2
  - Permit Total decrease of -0.064 tpy EO due to pre-operation reconciliations in Design from Feed to Final
    - Reconciliation of fugitive emissions estimates based on component counts and stream speciation, +0.871 tpy
    - Removal of flare cap, originally proposed two flares but only built on, -0.943
    - Permitted to 3 significant digits behind the decimal instead of 2.
- Future Permitting Updates
  - Minor regulatory and emissions updates post startup, including the addition of PTE for EO fugitive components (estimated at +0.112 tpy EO)

Research and Development Facility (R&D)

- Oct 2019, LDEQ Minor Source Permit 2825-02
  - Speciated EO emissions for this Minor Source permit to restrict PTE to less than 0.5 tpy; previous permit provided a general limit of 10 tpy for an individual HAP

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