



ZEROThe word "ZERO" in a bold, black, sans-serif font. The letter "O" is replaced by a stylized circular graphic composed of three overlapping segments in green, orange, and red, with a small subscript "2" to its right.



CASE STUDY

BEST PRACTICES FOR REDUCING TRUCK LOADOUT EMISSIONS

June 2020

SITUATION

The routine process of loading transport trucks with crude oil and condensate product at well sites and production pads often results in surges of emissions during loadout operations. When transport trucks are loaded from the storage tanks, the displaced vapor in the truck trailer is often discharged, or vented, into the atmosphere. These loadout emissions are largely composed of hydrocarbon vapors (volatile organic compounds, or "VOC") and air, and can amount to more than 10% of total emissions from a production site.

Facing these issues, an E&P company with operations in the DJ Basin of Colorado needed a way to reduce emissions levels associated with truck loadouts to lower overall Potential to Emit from the production pad. Lower PTE facilitates more efficient permitting and compliance, reducing operating costs and minimizing capital investment.

SOLUTION

The operator considered two mitigation strategies. The preferred method had to achieve measurable reductions in emissions, have minimal impact on lease operating expense and to not adversely affect or change existing operational processes.

The operator first considered burning truck loadout emissions using flares and/or combustors. Flares and combustors, however, are not 100% efficient and typically result in some unburned VOC. Burning truck loadout emissions also generates larger amounts of NO_x and other greenhouse gases, and this practice is coming under greater scrutiny by many stakeholders who seek to reduce overall emissions from oilfield operations. In the final analysis, the operator rejected burning.

The operator chose EcoVapor's proven ZerO₂ solution as the preferred mitigation strategy. EcoVapor installed and commissioned a ZerO₂ unit on the operator's 3-well pad to handle tank vapor emissions from both surface oil storage tanks and truck loadouts.

Now, the operator channels emissions from truck loadouts back into the oil storage tanks. A legacy issue that previously made this method unattractive is that oxygen introduced from air mixed into the recovered gas during the process typically prevents its sale due to strict pipeline specifications limiting oxygen levels. Since EcoVapor's proven ZerO₂ solution safely and reliably removes oxygen from captured tank vapor gas, allowing it to be sold into the local pipeline. Problem solved.

Additionally, some operators expressed concerns that introducing air into the tanks could create a potential explosive risk. However, the explosive limits of typical hydrocarbon vapor require a minimum of 90% air in the vapor stream – well above what has been measured in truck vent emissions. Nevertheless, high oxygen content can impact the operation of the ZerO₂ reactor and dilution of the air/O₂ content can be achieved using produced gas available at the site.

More than 110 ZerO₂ installations are operating in US shale basins to eliminate millions of tons of greenhouse gas and volatile organic compound (VOC) emissions from oil storage tanks on wellsites and at central processing facilities. With new enhancements, the ZerO₂ system can now capture vapor that would normally be vented to the atmosphere as crude oil is loaded from storage tanks to tanker trucks. In a typical tanker truck loading operation for every 100-barrel loadout, about 40 pounds of volatile organic compounds are emitted. **Given the 3-well DJ pilot system's daily production, approximately 80 tons per year of emissions are being reduced from truck loadouts alone on one DJ Basin 3-well pad.**

BENEFITS

The benefits of mitigating truck loadout emissions using the EcoVapor ZerO₂ solution include:

- **Lower emissions.** Significantly reduced emissions of VOC and methane during truck loadouts. The operator estimated it reduced PTE by approximately 80 tons per year from the pad by capturing emissions from truck loadouts alone.
- **Increased profits.** Increased revenue from capturing and selling Btu-rich tank vapor gas. As a result, EcoVapor ZerO₂ systems typically pay for themselves in less than a year.
- **Reduced flaring and emissions.** Keeping more gas in the pipe means less flaring, which can significantly reduce or eliminate greenhouse gas emissions.
- **Improved safety profile.** Improved safety profile by reducing surface storage tank pressures.

ABOUT THE ZERO₂ OXYGEN REMOVAL SYSTEM

The patented ZerO₂ system offers operational flexibility, modularity and reliability. ZerO₂ units are skid mounted and have a small 4'x4' footprint with only one inlet and one outlet, so they can be installed on any production pad. The ZerO₂ is modular, with the ability to run multiple units in parallel to scale-up, or down, as volumes change during the life of a well. With no moving parts, ZerO₂ units are extremely reliable.



ZERO₂

Contact us today at
1-844-NO-FLARE (844-663-5273)
or Info@EcoVaporRS.com to see
if ZerO₂ is right for your truck
loadout operations.



In Pursuit of the Zero Emissions Wellsite

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