ECOVAPOR

SULFUR SENTINEL

SIMPLE, RELIABLE, AND
COST EFFECTIVE H_2S TREATMENT

CASE STUDY

DJ BASIN: AN ALL-IN-ONE H_2S SOLUTION

August 2020

SITUATION

EcoVapor installed its Sulfur Sentinel H_2S treatment unit at three separate sites in the DJ Basin to remove hydrogen sulfide from an operator's sales gas. Results to-date are hydrogen sulfide levels well below pipeline specifications of 10 ppm, a 75% reduction in direct costs of treatment, and avoidance of the negative downstream effects of liquid treatment. The Sulfur Sentinel has proven to be highly effective at removing H_2S at lower production volumes.

BACKGROUND - LIQUID SCAVENGERS

Forms of sulfur are a common contaminant in oil and gas production. In natural gas, the typical form is hydrogen sulfide (H_2S); a poisonous, corrosive, and flammable gas. "Sour gas" is the term for a natural gas containing greater than 4 ppm of H_2S by volume, and commonly the limiting specification in gas pipeline contracts.

The DJ operator was producing up to 2.5 million standard cubic feet per day of associated gas containing 20 to 50 ppm of H_2S. Triazine, a liquid sulfur scavenger, was being injected to remove H_2S from the gas stream at an average cost of $10,000 per week. Besides the direct cost of triazine, the operator was at risk of additional hidden costs associated with processing equipment failure and downtime due to the use of the liquid scavenger.

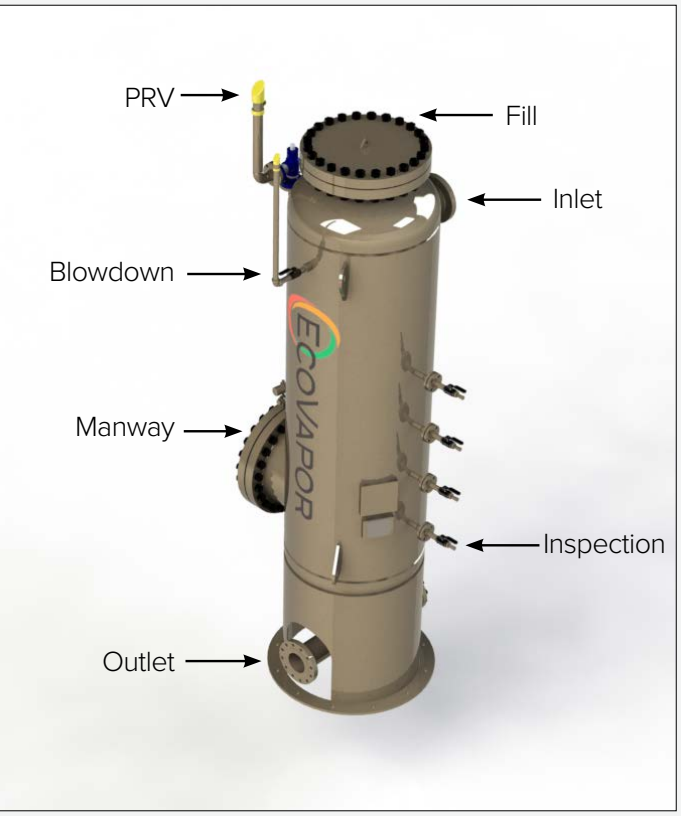
ENGINEERED DRY IRON OXIDE SCAVENGERS

In recent years there have been improvements in solid iron oxide scavengers and, after technical review, EcoVapor and the operator agreed to install the Sulfur Sentinel engineered dry solid scavenger. The improvements in scavenger primarily relate to increased adsorptive capacity with removal of any inert substrate, construction of the media particles, more reactive forms of iron oxide, and ease of media changeout. Hydrogen sulfide reacts with the iron oxide media to form non-hazardous iron sulfide and water, and the spent media is safely disposed of at local landfills.

ECOVAPOR'S SULFUR SENTINEL

Optimal performance in removing sulfur from produced gas is primarily a function of the velocity and residence time through the media bed. Finding the correct size vessel for the specific site conditions is important in optimizing costs since there is a trade-off between vessel size and frequency of media changes.

Flow through the media bed is enhanced with a diffuser to ensure optimal contact with the media, and the design incorporates four inspection ports for monitoring the sulfur loading and remaining bed life. The frequency of scavenger changes is a function of gas volume, H_2S concentration, and vessel size. A further economic benefit of solid scavenger is that the media only reacts to the hydrogen sulfide present, and there is no need to treat for maximum levels and the resulting "over-treating" common with triazine.



EcoVapor provides the media changeout service, which can typically be accomplished in a few hours with vacuum equipment to minimize any downtime.

Weekly monitoring is performed using Dräger tubes to evaluate the sulfur loading in the vessel. This is a cost effective way to assess the media life, determine when fresh scavenger is required, and takes only minutes. The inspection ports are designed so that the operator is not exposed to the hydrogen sulfide during the monitoring process.

H_2S concentration at the vessel outlet is typically monitored by the operator using a hydrogen sulfide analyzer. It became apparent that the operator's analyzer was providing inaccurate readings. EcoVapor and site personnel determined that the electrochemical sensor in the analyzer was being damaged by free liquid in the sample gas stream. It was not uncommon for the operator to replace the sensor every few days at a cost of several hundred dollars per sensor. The problem was resolved with the installation of **Ecovapor's Sensor Pro**, which not only removes free liquids but also provides rapid measurement results. By reducing sample gas pressure and the volume sent to the analyzer, detection lag time is typically reduced to 15 to 30 seconds.

ECONOMIC RESULTS

Treatment costs using the Sentinel were measured at $2,000 per week, a reduction in direct costs of over 75%, and operating efficiency on equipment downstream of gas treating has been significantly improved.

Payout for the installation of the Sulfur Sentinel was calculated at less than one month.

Besides the improved economics and performance, the operator remarked, “Site personnel no longer have to spend time managing the gas treating due to the simple, effective treatment solution.”

SULFUR SENTINEL PACKAGE

The Sentinel is offered in a variety of sizes to effectively treat flow rate, operating pressure, and H_2S concentration. Vessel sizes range from 30” to 84” in diameter with ANSI flange ratings of 150 psi and 300 psi. The package includes:

- Vessel delivery and installation
- Scavenger loading
- Weekly monitoring services
- Performance measurement
- Change-out services
- Disposal of the spent scavenger

This complete solution has proven to be a simple and cost-effective method of gas treating, reducing costs and allowing operators to focus on site operations. EcoVapor is ready to help you reduce your hydrogen sulfide treatment costs and improve site uptime.

ABOUT SULFUR SENTINEL

Sulfur Sentinel from EcoVapor gives operators an all-in-one solution for cost-effectively treating H_2S at oil and gas well sites. Sulfur Sentinel uses a simple, but highly effective dry iron scavenger to safely remove hydrogen sulfide from the gas stream without using chemicals. When the dry catalyst reacts with H_2S the byproduct is iron oxide dust, which can be easily vacuumed from the vessel and safely disposed of in local landfills without any special permits.

EcoVapor

Simple, Reliable and Cost-Effective H2S Treatment

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