

**Texas Commission on Environmental Quality
Air Permits Division**

New Source Review (NSR) Boilerplate Special Conditions

This information is maintained by the Chemical NSR Section and is subject to change. Last update was made **August 2011**. These special conditions represent current NSR boilerplate guidelines and are provided for informational purposes only. The special conditions for any permit or amendment are subject to change through TCEQ case by case evaluation procedures [30 TAC 116.111(a)]. Please contact the appropriate Chemical NSR Section management if there are questions related to the boilerplate guidelines.

SRUs - SRU (S), Incinerator (I), Upstream (U), Sulfur Pit/Loading (P)

Capacity (S) The total sulfur recovered from the Sulfur Recovery Units (SRUs) shall not exceed (#) long tons per day (LTPD). Each individual SRU shall not exceed a sulfur recovery rate of (#) LTPD.

BACT/records (S) The minimum sulfur recovery efficiency for the SRUs shall be (#, guidance document) percent on a daily average. The sulfur recovery efficiency shall be determined by calculation as follows:

$$\text{Efficiency} = \frac{(\text{S recovered}) * (100)}{(\text{S recovered}) + (\text{S incinerator})}$$

Where: Efficiency = sulfur recovery efficiency, percent
 S recovered = (elemental S in pit), lbs/day
 S incinerator = sulfur in incinerator stack, lbs/day

The sulfur recovery efficiency shall be demonstrated for each calendar day (24-hour period) by a mass balance calculation using data obtained from the incinerator stack sulfur dioxide monitor and sulfur production records. Records and copies of the compliance calculations shall be maintained.

storage/load (P) Emissions from the sulfur pits, sulfur storage tanks and sulfur railcar and loading (or degassing) operations shall be routed to the inlet of the SRUs (or the tailgas incinerator).

SO2 conc (I) The in-stack concentration of SO2 from the tail gas incinerator shall not exceed 250 ppm by volume calculated as an hourly average on a dry and air-free basis.

T, O2, and flow (I) The tailgas incinerator (TGI) firebox exit temperature and oxygen concentration shall be continuously monitored and recorded.

The temperature measurement device shall reduce the temperature readings to an averaging period of 6 minutes or less and record it at that frequency. The temperature monitor shall be installed, calibrated at least annually, and maintained according to the manufacturer's specifications. The device shall have an accuracy of the greater of ± 2 percent of the temperature being measured expressed in degrees Celsius or $\pm 2.5^{\circ}\text{C}$. (the oxygen monitoring requirements should be covered in the SO₂ CEMS condition)

The tailgas incinerator exhaust stack flow rate shall be continuously monitored and recorded. The flow shall be recorded at least every 15 minutes and the hourly average flow rate shall be recorded. Each flow monitoring device shall be calibrated at a frequency in accordance with the manufacturer's specifications, or at least annually, whichever is more frequent, and shall be accurate to within 2 percent of span or 5 percent of the lesser of the design value or the flow measured during the most recent stack test.

Quality assured (or valid) data must be generated when the tail gas incinerator is operating except during the performance of a daily zero and span check. Loss of valid data due to periods of monitor break down, out-of-control operation (producing inaccurate data), repair, maintenance, or calibration may be exempted provided it does not exceed 5 percent of the time (in minutes) that the tailgas incinerator operated over the previous rolling 12 month period. The measurements missed shall be estimated using engineering judgment and the methods used recorded.

The TGI firebox exit temperature shall be maintained at not less than (temperature, 1400 for example) $^{\circ}\text{F}$ and exhaust oxygen concentration not less than (percent, 3 for example) percent while waste gas is being fed into it prior to initial stack testing. After the initial stack test has been completed, the TGI shall be operated with not less than the oxygen concentration maintained during the last satisfactory stack test performed in accordance with Special Condition (#). The firebox chamber 6 minute average temperature shall be maintained above the hourly average temperature maintained during the last satisfactory stack test performed in accordance with Special Condition (#). (last sentence only used if there have been operating problems) The minimum high temperature cut-off for the thermal oxidizer shall be (#) $^{\circ}\text{F}$.

BACT (I)

The TGI shall either operate with no less than 99.9 percent efficiency in disposing of the acid gas waste streams or operate with an exhaust hydrogen sulfide concentration of less than 5 ppmv, corrected to 3 percent oxygen.

- Sample (I) Sample for SO₂, CO, H₂S, (possibly NO_x)
- CEMS (I) CEMS for SO₂, CO if > 75 TPY
- Sour water level (U) Sour water stripper feed tank shall be equipped with an interface level detection device which will provide sour water/hydrocarbon interface level detection. This detector shall alarm immediately should the sour water/hydrocarbon interface go below (#) feet.
- In addition, the sour water stripper feed tank shall be manually checked for hydrocarbons at least once per day using sight glasses. (#) feet of sour water shall be maintained in the feed tank at any given time. If hydrocarbons are discovered at or below the above indicated level, steps shall be taken to restore the sour water level back to the (#)-foot level. Records of all alarms and manual interface checks (sight glass checks) shall be maintained.
- All sight glasses shall be maintained and kept in operating condition according to manufacturer specifications.
- Sour water (U) The sour water stripper surge system shall have a minimum on-line retention time of three days based on a minimum of (#) percent capacity of the tanks and a maximum sour water flow rate of (#) gallons per minute into the tanks.
- There shall be at least 3 days of holdup (excess) capacity maintained for sour water storage. This capacity shall only be used for sour water storage when necessary to avoid flaring of acid gases due to reduced SRU complex capacity. It shall be restored within one week of the return of the sulfur recovery complex to normal operations.
- BACT (p) The liquid sulfur shall be degassed by an above grade air stripper (or equivalent device). The effluent from the degassing stripper will be routed to the front end of the Claus reactor.
- A. The degassed liquid sulfur shall be routed to a covered sulfur storage pit. The breathing vents from the sulfur pit shall be routed to the incinerator (or SRU).
- B. All sulfur shall be degassed to an H₂S content of 100 parts per million (ppm) or less prior to loading. All loading shall be submerged. Records shall be maintained indicating the truck or railcar loaded, loading start and stop date and time, and the volume

or weight of the sulfur loaded.

- C. The holder of this permit shall perform at his or her expense sampling and other testing as required to demonstrate the performance of the sulfur degassing system. The SRU shall operate at maximum sulfur production rate during sampling. Sampling methods and procedures must be approved prior to sampling by the TCEQ Regional Director or the TCEQ Compliance Support Division. The TCEQ Executive Director or designated representative shall be afforded the opportunity to observe all such sampling.
- D. The sampling required in C of this condition shall occur within 30 days after the SRU degassing system starts operation and, after that, at least once every 12 months. Within 30 days after such sampling is completed, two copies of the final sampling report shall be forwarded to the TCEQ, one copy to the TCEQ Regional Office, and one copy to the TCEQ Compliance Support Division.

Outages (s)

In the event that a sulfur recovery train must undergo an unscheduled (emergency) shutdown, the acid gas feed stream may be routed to the plant flare for a period not to exceed (#) hours. Within (#) hours of diverting the acid gas feed to the emergency flare, the permit holder shall begin the following procedures:

- A. the accumulation of sour water and curtailment of upstream production units to reduce the acid gas feed rate to the remaining sulfur recovery train.
- B. commencement of refinery shut-down procedures if no sulfur recovery facilities are operational.

All operations in this mode shall be documented and the emissions resulting from this operation shall be estimated using good engineering practice and be recorded. The TCEQ region office and any local programs shall be notified within one hour of commencing such operations.

(this condition is only to be used if the flare emissions associated with this operation are on the MAERT)

Opacity (i)

There shall be no visible emissions from the tail gas incinerator stack(s).

Amine level (u)

The rich amine charge tanks shall be equipped with a level detection device. This detector shall alarm immediately should the

amine/hydrocarbon level go below the minimum set point on the level controller. In addition, the rich amine charge tanks shall be manually checked for hydrocarbons at least once per day using sight glasses. Records of all alarms and manual level checks shall be maintained.

All sight glasses shall be maintained and kept in operating condition according to manufacturer specifications.

Ammonia (u)

The acid gas entering the first catalyst bed shall be sampled for ammonia on a (applicable basis) basis, and the ammonia concentration shall not exceed (#) ppmv at any time. Drager tubes or another sampling method, as approved by the TCEQ, shall be used to sample for ammonia. Records of the sampling time, date, and sampling results shall be maintained.