

At the request of USCG Sector New Orleans, a rough modeling assessment was conducted using NOAA's ALOHA Plume Dispersion Model. The reported situation was a release of 150 lbs/hr of Sulfur Dioxide due to a failure of a recovery unit at a facility near Belle Chasse, LA. For modeling purposes, both 150 lbs and 500 lbs/hr were assessed at 5, 10, and 15 kt winds. The forecast was for 5 to 15 kt winds. Higher winds generally create greater dispersion and reduce threat distances. Very low wind conditions and inversions can result in heavy gasses accumulating creating even greater threats. The following information provides a quick assessment, please contact the NOAA Scientific Support Coordinator to discuss relevant aspects in more detail.

The facility is located on the RDB (western-side) of the Mississippi River near Mile Marker 66. At present, the winds are from the N, which would actually transport much of the pollution release parallel to the river at this location (see map). Deviations in winds are common, so this situational threat should be monitored. The river is immediately adjacent to the facility.

Sulfur Dioxide

Sulfur dioxide is a colorless gas with a pungent odor. Exposure to very high levels of sulfur dioxide can be life threatening. Exposure to 100 parts of sulfur dioxide per million parts of air (100 ppm) is considered immediately dangerous to life and health even for short-term exposures (IDLH Value). The ERPG-3 value for Sulfur Dioxide is listed as 15 ppm (see additional information below). Exposures at lower levels have been linked to wheezing, chest tightness and shortness of breath.

The following table provides an assessment of the ALOHA Model output for a release of Sulfur Dioxide. There are many unknowns associated with the actual release rate and release conditions; therefore these values should only be used as an initial "rough estimate" evaluation tool.

ALOHA Estimations (SO₂ Release, 5 Dec. AM)

Release	Wind Speed	ALOHA Threat Dist. (in yds)		
		ERPG-3 (15 ppm)	ERPG-2 (3 ppm)	ERPG-1 (0.3 ppm)
150 lbs/hr	5 kts	230 yds	560 yds	1900 yds
150 lbs/hr	10 kts	130 yds	310 yds	1000 yds
150 lbs/hr	15 kts	<50 yds	<50 yds	430 yds
500 lbs/hr	5 kts	440 yds	1000 yds	3500 yds
500 lbs/hr	10 kts	250 yds	580 yds	1900 yds
500 lbs/hr	15 kts	200 yds	470 yds	1600 yds

Note, these values reflect the weather conditions on the morning of 5 December only... changes in atmospheric conditions may have a significant effect on the values reported. In addition, ALOHA only assesses the release over a 1 hr period; it does not assess any longer term accumulations during periods of poor dispersion (such as low winds).

ERPGs:

The Emergency Response Planning Guideline (ERPG) values are intended to provide estimates of concentration ranges where one reasonably might anticipate observing adverse effects as described in the definitions for ERPG-1, ERPG-2, and ERPG-3 as a consequence of exposure to the specific substance.

-The ERPG-1 is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hr without experiencing other than mild transient adverse health effects or perceiving a clearly defined, objectionable odor.

-The ERPG-2 is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hr without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.

-The ERPG-3 is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing life-threatening health effects.

Summary Comments

In general, most of the immediate threat would be located at or near the facility. The actual dynamics of the release such as the actual gas mixture and temperatures are unknown; therefore, the modeling information provides only a “rough” or first cut assessment. It is believed however, that since the release is not a pure stream of SO₂, these values should provide a reasonable assessment as to immediate risk (this should probably say – conservative, or errs of the safety side). The facility is located on the RDB (western-side) of the Mississippi River near Mile Marker 66. At present, the winds are from the N, which would actually transport the pollution release parallel to the river at this location (see map). A moderate risk exists S of the facility, which should be further delineated by local responders to assess public threats. Deviations in winds are common, so the situational threat to the river should be monitored. The river is immediately adjacent to the facility. For additional discussion, please contact the NOAA Scientific Support Coordinator.