

Chlorine Release

This plan applies to an uncontrolled release of any quantity of chlorine gas.

INITIATION AND NOTIFICATION

The individual who first notices the release should contact the Utility/Facility Manager immediately by whatever means of communication may be available.

Notification phone numbers are in the Organization Contact List in the Appendices of the ERP.

Once a there is a confirmation of a release of chlorine gas, notify:

1. Utility Manager and/or his/her designee.
2. Local Fire Department
3. Virginia Department of Health – Office of Drinking Water

EQUIPMENT IDENTIFIED

Chlorine is a highly toxic gas stored under pressure on this site. Chlorine is toxic by inhalation and high concentrations can cause skin irritation and severe eye injury.

Note only trained personnel should attempt to use any emergency tools or Personal Protective Equipment (PPE)

Equipment	Location
Self-Contained Breathing Apparatus (SCBA), Level “A” Personal Protective Equipment (PPE)	
Chlorine Emergency Kits	
Ammonia bottle for small leaks	
Designated chlorine use tools	
Portable chlorine/oxygen alarm	

SPECIFIC ACTIVITIES

I. **Assess the Problem**

Move personnel or seek shelter away from the release area.

Fully PPE protected personnel may be required to rescue personnel in the release area.

Rate & volume of release, size of container, and wind direction will all influence the ability to control the release as well as determine the impact of the release on both on-site and off-site personnel

The following general steps will be prudent:

1. Determine number and severity of any injured personnel.
2. Estimate the rate and volume of the release.
3. Determine wind directions and potential for additional on-site and off-site impacts.
4. Based on number of adequately trained and equipped personnel, determine response capability (in-house or off-site personnel).
5. Activate the facility Emergency Operations Center (EOC), as appropriate..

II. **Isolate and Fix the Problem**

Shelter-in-Place, Evacuation, or a combination may be an appropriate response. The facility Incident Commander [IC] will have the best initial information on the magnitude of the release and be the best to dictate on-site as well as suggest off-site actions.

Provide victims with fresh air (and oxygen by trained personnel) and have contaminated clothing removed to prevent further injury.

Only properly trained and equipped personnel can assure a successful control of this release. Untrained or under-equipped personnel will only become more victims.

Only trained personnel using pre-planned procedures should respond to uncontrolled chlorine releases. Attempt to install a Chlorine Emergency Kit ONLY if you are familiar with the kit and trained in its use.

1. Remove clothing of contaminated personnel.
2. Bag the clothing.
3. Wash victims thoroughly with soap and water.
4. Rinse eyes with plain water for 10 to 15 minutes.

5. Have Safety/Security notify the incoming emergency equipment and ambulances of staging location.
6. Detect small chlorine leaks with an atomizer or squeeze bottle filled with aqueous ammonia. (A white cloud will show the location of the leak).
7. Attempt to close the main source valve prior to entering the area.
8. **IF** this does not stop the release (or it is not possible to reach the valve), **THEN** allow the gas to release in place or remove it to a safe area and allow the gas to be released there.

III. **Monitoring**

0.5-ppm chlorine over 8 hours has shown no effects.

Chlorine gas can replace Oxygen in a facility. A 19.5% O₂ level is required for entry.

Delays of exposure symptoms can occur so monitor all potentially exposed personnel.

Facility area monitoring should continue until all levels reach below 0.5 ppm after repairs are completed.

1. Monitor the surrounding area for Chlorine gas levels and oxygen. (The Chlorine level must be below 0.5 ppm and the atmosphere must have at least 19.5 percent oxygen before personnel can be allowed in the area without Self Contained Breathing Apparatus (SCBAs.))
2. Victim should be monitored for signs of exposure which can include:
 - a. Coughing
 - b. Chest Tightness
 - c. Burning sensation in the nose, throat, and eyes
 - d. Burning pain, redness, blisters similar to frostbite
 - e. Blurred Vision
 - f. Nausea and Vomiting
 - g. Fluid in the lungs within 2-4 hours
 - h. Difficulty breathing or shortness of breath
 - i. Watery Eyes

IV. **Recovery and Return to Safety**

Notes will provide details of who, what, when, and why decisions were made. This will help in the evaluation of the incident response and in cost recovery.

Exposure to chlorine should not exceed OSHA levels for workers. Exposure levels for community members should be separately determined.

1. Maintain detailed notes of all actions
2. Re-entry by un-protected facility personnel should not occur until completion of all repairs and the ppm of chlorine is below 0.5. Off-site emergency personnel should establish community re-entry levels, but should not be higher than 0.5 ppm.
3. Conduct a detailed evaluation of the failure that caused the release. This could include engineering, personnel, security and metallurgical evaluations.
4. Hold post-incident discussions to include all responders and actors in the response and recovery

V. **Report of Findings**

Correlate and establish all the components of the incident in writing. This would include why the release occurred, the management of the response and suggestions to improve the facility/community response in the future. The report should incorporate all relevant data from the forensics of the release to suggested changes in the emergency response plans and procedures.

Submit suggestions from the report to the governing board/individuals for evaluation and actions to be taken.