ON-SITE / OFF-SITE EMERGENCY PLAN

[A Per Schedule - 8A, Under Rule - 68-J (12)(1) of Gujarat factorise Rules 1963(2004) and Schedule - 11 Under Rule 13(1) of MSIHC Rules - 1989 (2000)] J

Address : 4, NU 10 B, Gayatri Kunj, Ward 10B, Shakti Nagar, Gandhidham, Gujarat 370201

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CHAPTER- 1
INTRODUCTION

1.1 Introduction to this Plan

Primarily this plan is prepared to furnish details which may require at the time of the emergency, to delegate responsibility, to estimate the consequences in advance and to prepare us to control any type of EMERGENCY. This plan is in two sections. The first section explains basic requirements as follows:

- Definition.
- Objectives.
- Hazard Identification.
- Risk Analysis and Environmental Impact Assessment.
- Organization set up.

- Communication System.
- Action on site.
- Link with Off-site Emergency Plan.
- Training rehearsal and record aspect.

The second section is given as an annexure section containing useful annexures. These annexures are designed to give specific information required during emergency. Ready information in all these annexures will considerably save time in initiating all actions at the time of emergency. It will also be useful to the Govt. for preparing the Area Emergency Control (Contingent) Plan.

A separate chapter is given to pay attention on:

- Offsite effects of any emergency.
- The duties and function to control it.
- Link with On-Site Emergency Plan.

1.2 Identification of the factory:

M/S Archean Chemical Industries Limited is a key player in the Marine chemical sector, specializing in producing Marine chemicals like bromine, industrial salts, and sulphate of potash. Our manufacturing operations are primarily located in Various regions, with the Hajipir site being one of their major locations.

Hajipir Site Overview:
The Hajipir site is strategically located in the salt-rich Kutch district of Gujarat, benefiting from proximity to the Rann of Kutch, an area known for its vast salt flats and brine reserves. This location is ideal for Archean's operations, which rely on brine extraction and the processing of minerals.

Fact Sheet

1- Full name & Address of Factory: Archean Chemical Industries Limited Hajipir Site, Near Rann of Kutch District, Gujarat, India.

2- Location Co-ordinators: The factory is around 130 Kms away from Bhuj City and 70 Kms away from Nakhatrana. It is 15 Kms away from Hajipir Village.

3- Corporate Office: Archean Chemical Industries Limited Address: 4, NU 10 B, Gayatri Kunj, Ward 10B, Shakti Nagar, Gandhidham, Gujarat 370201

4- Head Office: Archean Chemical Industries limited No 2, Ground Floor, North Crescent Road, T Nagar, Chennai - 600017, Tamil Nadu, India.

5- Telephone Nos.: Factory +91 9499899073 Corporate Office +91 44 610 99 999

6- Full name of the Occupier: Mr. S. Meenakshisundaram

7- Full Name & Residence of Factory Manager: Mr. R.P Singh, Archean Guest House Nakhatrana Near Rann of Kutch- District.

1.2 Working Shifts:			
Shift	Male	Female	Total
General	130	-	130
First	40	-	40
Second	25	-	25
Third	25	-	25
	220	-	220

13.First person to be contacted in case of emergency.

Shift	**Person To Be Contacted in Case of Emergency**			
	Name & Designation	**Place of Availability**	**Phone No.**	
			Office	**Residence**
General (9.30AM to 05.30PM)	Mr. J.S Bedi Site Head	ADMIN Office	Mobile- 9428252132	-
	Mr. R. P Singh Head - HR	ADMIN Office	Mobile- 9499899073	-
	Mr. Rajendra Tak Head EHS	SOP Building	Mobile- 9409104656	-

1.3 Map of the Area

A detailed map of the zone has been given in Annexure-2.

1.4 Definitions

Various definitions on different analogy used on On-site & Off-site Emergency Plan are as follows: -

Accident: -Is an unplanned event having probability of causing personnel injury or property damage or both. It may result in physical harm (injury or disease) to a person(s), Damage of property, loss to the company a near miss or any combination of these effects.

Major Accident: -Is a sudden, unexpected, unplanned event, resulting from uncontrolled developments during an industrial activity, which causes, or has a potential to cause severe damage to the person(s) or property(s) or environment or any combination of these effects.

Emergency: -An emergency could be defined as any situation which presence a threat to safety of the person or/and property. It may require outside help also.

Major Emergency: -Is one that affects several dept., within it and /or may cause serious injuries, loss of life, and extensive damage to property or serious disruption outside the works. It will require the use of outside resources to handle it effectively.

Note:-(Emergency due to operating conditions uncontrolled reactions, small fire, small gas leak, spill, failure of power, water, air, steam, cooling media, scrubbing media etc) and which can be locally handled by plant personnel alone (without side help) is not considered as major emergency.

On-Site Emergency: - An accident takes place in a factory and its effects are confined to the factory premises involving only the people working in the factory.

Off-Site Emergency: -If an accident takes place in a factory and its effects are felt outside the factory premises, the situation thus generated is called an off-site emergency.

Disaster: -Is a catastrophic situation in which the day-to-day patterns of the life are, in many instances, suddenly disrupted and people are plugged in to helplessness and suffering and as a result need protection, clothing, shelter, medical and social care and another other necessity of life, such as:

1. **Natural:** -Disasters resulting from the natural phenomena like earthquakes, volcanic eruptions, storm, surges, cyclones, tropical storms, floods, landslides, forest fires and massive insect infection also on this group, violent draught which will cause a creeping disaster leading to famine, diseases and death must be included.

2. **Man Made:** -Second group includes disastrous events, occasioned by men, or by man's impact up to the environment. such as armed conflict, industrial accidents, factory fires, explosions and escape of toxic gases or chemical substances, river pollution, mining or other structural collapses, air, sea, rail and road transport accidents, aircraft crashes, collisions of the vehicles carrying inflammables liquids, oil spills at sea and dam failures.

Hazard: -Is a physical situation / condition which has a potential to causes human injury, damage to the property or the environment or some combination of these criteria.

Risk: -Is the likelihood of an undesired event (i.e. accidents, injury or death) occurring within a specified period or under specified circumstances, it may be either frequency or a probability depending on the circumstances.

1.5 Objective of the Emergency Plan:

A major emergency at Archean Chemical Industries Limited is defined as a situation that poses a significant risk of serious injury, loss of life, or extensive property damage. Key causes of such emergencies may include plant or equipment failure, human error, sabotage, fire, toxic gas leaks, explosions, and mass food poisonings. Major accidents are sudden, unexpected, and unplanned events resulting from uncontrolled developments during manufacturing activities, including production units, storage, handling of materials, and utilities. It is the policy of Archean Chemical Industries Limited that every individual must be aware of and understand their role in the event of a fire, explosion, toxic release of gases/materials, or mass food poisoning.

Scope

The purpose of preparing an emergency control plan at Archean Chemical Industries Limited is to outline as many details as possible for potential emergencies and provide clear instructions on the actions to be taken by individuals in the event of a fire, explosion, toxic gas release, or mass food

poisoning within the plant and its surrounding areas. This plan complements the actions taken by process personnel, who will follow their specific plant emergency procedures. While these instructions are intended to be general, it is important to recognize that they cannot cover every possible situation in detail. The goal is to minimize confusion and expedite response actions for everyone.

Objectives

A disaster is defined as significant damage to life, property, and the surrounding environment when an emergency becomes uncontrollable. Emergencies can arise from abnormal operational functions or natural factors.

The objectives of Disaster Plan include mainly the following:

1. To assess and define the emergency, including the risk in the Manufacturing unit and Environmental Impact Assessment.

2. Controlling the emergency to contain the incident and elimination of hazard.

3. Treatment of affected/injured persons, safeguard employees and people in the vicinity, by timely evacuations.

4. Informing superior, authorities, fire brigade and get help from mutual aid-neighbors.

5. To minimize damage to property and the environment.

6. Keep inform employees, public in general/authorities about the hazards/risk assessed, safeguard provided, residual risk if any and the role to be played by them in the event of emergency.

7. To effect rescue and treatment of causalities and head count for injured & any death and inform and to help relatives.

8. To preserve records, equipment etc. and to organize investigation into the cause of emergency and preventive measures to take care of any recurrence.

9. Ensuring safety of the plant/equipment before person resumes work.

10. To work out a plan with all provisions to handle emergencies and to provide for emergency preparedness and the periodical rehearsal of the plan.

11. Restoring normalcy.

CHAPTER 2
RISK AND ENVIRONMENTAL IMPACT ASSESSMENT

2.1 Factory layout

Detailed Factory layout of the zone has been given in Annexure-3.

2.2 Storage hazards and controls

Hazardous Substances and Quantity stored: The information has been given in Annexure-4.

For Chemical/ Physical/ Toxicological/Fire Data of various chemicals, please refer Annexure-34

2.3 Manufacturing Process and their control

The Hajipir site of M/s. Archean Chemical Industries Limited, located in the Kutch district of Gujarat, is a key production facility focused on the extraction and manufacturing of Bromine, Industrial Salt. The site's proximity to the Rann of Kutch provides access to brine-rich resources, which are essential for producing bromine, industrial salt, and sulphate of potash (SOP).

Bromine Manufacturing Process

Process Overview: Bromine is extracted from brine, which contains dissolved bromide ions. The process involves a series of chemical reactions and mechanical separations.

Brine Extraction: High-bromide-content brine is extracted from deep wells.

Oxidation: The bromide ions in the brine are oxidized using chlorine gas, converting them into bromine gas.

Stripping and Absorption: The bromine gas is stripped from the solution and absorbed in sulfuric acid.

Purification: The bromine is distilled and purified, resulting in high-purity liquid bromine.

Control Mechanisms:

Brine Composition Monitoring: Regular analysis of the brine to ensure optimal bromide content for efficient bromine production.

Oxidation Control: Real-time monitoring of chlorine dosing and the pH levels of the solution.

Distillation Controls: Temperature and pressure control to ensure effective separation and purification of bromine.

Safety Systems: Automatic shutoff and alarm systems for gas leaks, temperature, and pressure deviations.

Supporting Systems for Process Control

DCS System

DCS systems are implemented throughout the site to allow for real-time monitoring and control of critical parameters (temperature, pressure, flow rates, chemical concentrations, etc.) in all production units.

Operators can monitor the entire process through a centralized control room and adjust remotely to optimize production.

Automated Safety Shutdowns:

Automated systems ensure that production processes are shut down in the event of any critical anomalies, such as high temperatures, pressure buildups, or leaks, to prevent accidents or equipment damage.

Quality Control Laboratories:

On-site laboratories conduct continuous quality checks at various stages of production. Chemical analysis and tests are carried out on raw materials, intermediate products, and final products to ensure they meet the required specifications.

Waste and Emission Control Systems:

The plant operates under stringent waste management protocols. Emission control equipment, including scrubbers and filters, ensure that harmful by-products and gases are contained or neutralized before being released into the environment.

Water used in the processes is often recycled, and effluent is treated before disposal. Also water Harvesting system designed to Collect and Re-use Rainwater.

Energy and Resource Efficiency:

Solar evaporation for salt production maximizes the use of natural energy. Efficient energy use is prioritized in the distillation and crystallization processes to reduce the environmental footprint.

2.4 Other Hazards and Controls:

Please refer Annexure No.7

2.5 Waste Disposal:

Classification and Segregation

Waste Classification: Trade waste is classified based on its type, such as hazardous, non-hazardous, waste. This classification helps in determining the appropriate disposal methods.

Segregation: Waste is segregated at source into different categories. For example, hazardous chemicals are separated from general industrial waste. This segregation prevents contamination and facilitates proper disposal.

Hazardous Waste Safe Handling Procedures:

Specialized equipment and trained personnel handle waste to minimize risks of exposure and accidents. Safety protocols are strictly followed.

Storage Facilities:

Waste is stored in designated areas equipped with containment systems to prevent leaks and spills. Hazardous waste is stored in secure, labeled containers with appropriate safety measures.

Treatment and Disposal Methods:

Chemical Treatment: Bromine Effluent is Naturized by Lime and Stored in Settling Pond and the Remains ETP Sludge is used to Manufacturing Gypsum and Internal Road/bund Strengthening work.
Regulatory Adherence: The waste management practices comply with local, state, and national regulations, including those set by the Pollution Control Board and other relevant authorities.
Permits and Documentation: Membership for other waste disposal is obtained, and records/ Manifest are maintained for tracking waste generation, treatment, and disposal.
Monitoring and Reporting
Environmental Monitoring: Regular monitoring of waste management processes ensures compliance with environmental standards and helps detect any potential issues early.
Reporting: Detailed records and reports of waste handling and disposal are maintained for regulatory review and audits.
Environmental Impact Mitigation
Emission Controls: Systems are in place to capture and treat any emissions resulting from processes to prevent environmental contamination.
Waste Reduction Initiatives: Efforts are made to minimize waste generation through process optimization, material substitution, and waste reduction strategies.
Employee Training
Training Programs: Employees are trained on proper waste handling, segregation, and emergency response procedures. Regular refresher courses ensure that staff are up to date with best practices and regulatory requirements.

2.6 Records of Past incidents:

No Major Accident History in Past.

2.7 Risk Assessment:

All our activities are assessed for qualitative Risk Assessment under ISO-45001 and QRA for critical chemicals, their storages are done through software the results of which are available in **Annexure- 10** in form of consequence analysis.

Apart from this the processes are established after detailed HAZOP studies; The HAZOP Study books are available with **HOD-HSE** for reference during Emergency.

Besides, physical / Toxicological / Fire data of chemicals is listed in **Annexure - 34**

List of Dangerous Operations

Sr. No.	Name of Hazardous Operation	Hazards Involved
1.	Manufacturing of Bromine and SOP	Severe Health Hazard
2.	Use of Acids	Severe Health Hazard
3.	Use of Alkalis	Severe Health Hazard
4.	Boiler Operation	Possibility of Blast
5.	Operation of Compressor	Possibility of Blast
6.	Operation of D G set	Electric Shock
7.	Welding, Cutting and Grinding of Metals	Burn Injury, Physical & Mechanical Injury

List of Hazardous Processes:

Details of Hazardous processes are described in Annexure: 6 (In Process and Vessel Hazards and controls)

General preventive steps to be followed to avoid any type of disaster are enumerated below: -

1. Unauthorized person should not be allowed to enter in the storage areas.
2. No person should be allowed to carry any matchbox or lighter or combustible products in the Diesel storage area.
3. While unloading/loading tankers, engine should be stopped.
4. In case there is any leakage/spillage from flange, valve/fitting person noticing this should immediately get it attended and informs supervisors/engineers to rectify the fault.
5. Tankers must be earthen before unloading/loading.
6. Toolbox & first aid box to be provided near storage area.
7. Water shower/eye wash fountain to be provided in the area.
8. Off specification material should not be unloaded.
9. It is advisable not to run pumps dry.
10. Before unloading tanker operator & persons Incharge must take initial and final level of storage vessel to ensure that total quantity stored is within limits.
11. Earthing to all storage vessels must be provided.
12. Vents lines must be provided on every storage tank.
13. Rusty pipe lines fittings or leaky valves must be immediately replaced.
14. To prevent corrosion, anti-corrosion paint must be regularly applied on vessel and pipeline.

General Accident / Disaster Preventive steps have been provided by the company; details are as below:

1. Safe Operating Procedures have been made for all processes & operations and these are being operated according to Safe Operating Procedures. Staff is also trained for the same.
2. Hazardous chemicals stored in separate storage along with all safety measures.
3. Bromine and Chlorine detectors are installed and emergency gas leakage handling kits and scrubbing arrangements is provided for handling emergency.
4. Hydrogen detectors & Sprinkler system has been provided at hydrogen cylinder storage area for detection and controlled actions by concerned Shift Incharge
5. SO2 Sensor has Provided in SO2 Tonner Charging Area.
6. Hazardous operations are carried out by trained person & under supervision.
7. Hazardous chemicals are handling in close circuit by skilled persons.
8. Enclosures are provided with vent connected to scrubber, for Bromine, Chlorine, SO2 etc.
9. All safety fittings like Safety valve, Pressure reducing valve, vent, flame arrestor, pressure / temperature indicators, level indicators, rupture discs etc. are provided to the equipment of concern.
10. Periodical testing by competent person for Pressure vessels and Lifting tackles.
11. Preventive maintenance is done periodically for all concern equipment.
12. Calibration of all instruments in the plant is carried out periodically.
13. Interlocks are provided as & where required, in manufacturing processes.
14. Loading / Unloading ensured with earthing & bonding for HSD.

15. Flameproof fitting, Earthing & Bonding of equipment's where Required.
16. Work permit system is being followed strictly.
17. Periodic On-site emergency Mock drills are arranged.
18. Work area monitoring is being done periodically.
19. Safety trainings are given to the employees for handling of hazardous chemicals.
20. First aid treatment is provided through well-equipped first aid box & Occupational Health Center. Trained first aid persons are available in each shift. Pre employment & periodic medical examination is done.
21. Decontamination facilities are provided
22. Well-maintained SCBA set & Emergency Airline respirators have been installed at conspicuous places.
23. Necessary PPE's are readily available. Jobs are accomplished using relevant PPEs
24. Deployment of competent supervisors for supervising hazardous activities.
25. Necessary cautionary placards are displayed at conspicuous places in company.
26. Eating & Chewing has been prohibited in manufacturing area.
27. Vehicle and strangers' movements are being regulated.

Spill Control:

1. Spill control procedures are displayed in Plant and QC Area. Spillage should be controlled as per concerned spill control procedure.
2. Keep unprotected personnel up wind.
3. Like any spilled materials to contain. Absorb spilled liquid by dry absorbent clay or sawdust.
4. Collect most of the contaminated absorbent with shovel for further disposal/incineration.
5. If spill of material directly on the ground, dig up and remove saturated soil for disposal/incineration.
6. Inactivate poisonous chemical with suitable method.

Storage of Bromine ISO Container:

1. **Storage Location and Design:**
   Archean Chemical Industries has designated a dedicated, well-ventilated, and isolated storage area for Bromine ISO containers to prevent potential risks.
   The storage area is: Away from Main Operations: The containers are kept at a safe distance from operational areas to minimize risk in case of leaks or accidents.
   Secured and Fenced: The storage zone is fenced, with restricted access to authorized personnel only, ensuring the security of hazardous materials.
   Proper Drainage System: The area has an adequate drainage system to contain any potential leaks or spills, preventing them from spreading.

2. **Ventilation and Temperature Control:**

   Temperature-Controlled Environment: The storage area is equipped with a ventilation system to maintain an appropriate temperature range, preventing excessive heat that could increase the pressure inside the Bromine ISO containers.
   Ventilation Design: The area is designed to ensure cross-ventilation to avoid the accumulation of hazardous fumes in case of leaks.

3. **Proper Grounding and Bonding:**
   Electrostatic Discharge Prevention: The storage facility has grounding and bonding systems in place to prevent any electrostatic discharge, which could cause fire or explosions around Bromine ISO containers.
   Non-Sparking Tools: All equipment used in the vicinity of the containers is non-sparking to minimize the risk of ignition.

4. **Storage Compatibility:**
   Separation from Incompatible Materials: The Bromine Storage containers are stored far away from incompatible chemicals, reducing the risk of dangerous chemical reactions.
   Fire and Explosion Protection: Water Sprinkler systems are installed near the storage area to Minimize the Dispersion of Bromine and Chlorine Exposure to Atmosphere.

5. **Container Handling and Inspection:**
   Archean ensures Regular Inspection: The containers are inspected regularly for any signs of corrosion, leaks, or damage. Special attention is given to the container valves and pressure gauges.
   Leak Detection Systems: Early detection of any potential leaks is ensured through regular checks and advanced leak detection systems, such as gas sensors installed in the area.
   Proper Positioning: Containers are stored upright and secured in place with appropriate restraints to prevent accidental movement or tipping.

6. **Labeling and Documentation:**
   Clear Labeling: Every Bromine ISO container is clearly labeled with hazard symbols, contents, and handling instructions as per the Globally Harmonized System **(GHS)** classification.
   Accurate Documentation: Archean maintains comprehensive records of all Bromine ISO containers in storage, including quantities, batch numbers, inspection history, and safety data sheets **(SDS).**
7. **Emergency Preparedness and Response:**
   Onsite Emergency Plans: A robust emergency response plan is in place, which includes evacuation routes, emergency shutdown procedures, and first aid measures in the event of exposure or a spill.
   Training for Personnel: All staff handling Chemicals undergo regular safety training on handling hazardous materials, including emergency response and personal protective equipment (PPE) use.
   Personal Protective Equipment (PPE): Employees are provided with full-body protection suits, face shields, and chemical-resistant gloves when handling the containers.
8. **Fire and Spill Control Systems:**
   Containment Dikes: Secondary containment systems such as dikes or bunds provided surround the storage area to prevent the spread of bromine in case of a Storage Tank breach.
   Neutralizing Agents: Bromine spill response kits, including neutralizing agents like sodium thiosulfate, are available at the storage site for immediate use in case of a spill.
9. **Access Control and Security:**
   Restricted Access: Only trained and authorized personnel are allowed access to the storage facility.
   Security Protocols: The storage area is secured with physical barriers and surveillance to prevent unauthorized access or tampering.

CHAPTER 3
EMERGENCY ORGANIZATION

3.1 Incident Controller

Incident Controller's role is to control the emergency at the incident site

Duties of Incident Controller
Incident Controller will proceed to the place of emergency after hearing siren/announcement and will: -

1 Assess the scale of emergency and decide if a major emergency exists or is likely, accordingly activate emergency procedure.
2 Immediately give his feedback to Emergency Control Center (ECC) on Main Gate regarding emergency.
3 Direct all operations within the area with the following priorities.
   a Secure the safety of personnel
   b Minimize damage to plant property and environment.
   c Minimize loss of material.
4 Direct rescue and fire-fighting operations carried out by Emergency Response Team till the arrival of the outside Fire Brigade, he will relinquish control to Officer.
5 Ensure that the affected area is searched for causalities.
6 Ensure that all non-essential workers in the affected area evacuate to the appropriate assembly point.
7 Set up communication point to establish Radio/Telephone/Messenger contact as with emergency control center (ECC).
8 Pending arrival of Site Main controller, assume the duties of the post to:
   a Direct the shutting down and evacuation of plants and areas likely to be threatened by emergency.
   b Ensure that the outside emergency services have been called in.
   c Ensure that the key personnel and Emergency Response Team members have been called in.
9 Report all significant developments to the Site Main Controller.

10 Provide advice and information, as required, for the Concern Person.
11 Preserve evidence that would facilitate any subsequent inquiry into the cause and circumstances of emergency.

Dy. Incident Controller will carry out above said duties in absence of Incident Controller. In addition, he will be available at the incident place and provide all required information as desired by the Incident Controller

3.2 Site Main Controller

Site Main Controller is overall Incharge of emergency organization

Duties of Site Main Controller:

1. Overall Responsibility to control the incident.
2. Co-ordinate ECC or, if required, security for raising evacuation siren and also all clear siren, in case emergency is over.
3. In case, he feels necessary to be at Incident Place, he shall nominate some-one, responsible to be in ECC so that communications received in ECC can be suitably diverted to him/ addressed suitably
4. Declaration of major emergency ensures that outside emergency services are called and when required nearby firms and/ or mutual aid members are informed.
5. Ensure that key personnel are called in.
6. Exercise direct operational control on parts of the works outside the affected area.
7. Maintain a speculative continuous review of possible developments and assess these to determine most possible cause of events.
8. Direct the shutting down and evacuation of plants in consultation with key personnel.
9. Ensure causalities are receiving adequate attention; arrange for additional help if required. Ensure relatives are advised.
10. Liaison with Chief Officers of the Fire and Police services providing advice.
11. Ensure the accounting and head count of personnel.
12. Control traffic movement within the work.
13. Arrange for a chronological record of the emergency to be maintained.
14. During prolonged emergency, arrange for the relief of the personnel and provision of catering facilities.
15. Contact the local office to receive early notification of impending changes in weather conditions, in case of prolonged emergency.
16. Issue authorized statements to the news media and inform H.O.
17. Ensure that proper consideration is given to the preservation of evidence.
18. Control rehabilitation of affected areas on cessation of the emergency.

3.3 Other Key Personnel

The key personnel required for taking decision about further action for shutting down the plant, evacuate the personnel, and carry out emergency engineering works in consultation with Site Main Controller considering the information received.

HOD's /Senior Managers/ Section Heads are responsible for safety, security, fire, gas and pollution control, spillage control, communication system including telephone, wireless etc. Also, medical services, transport, engineering, production, technical services, will form part of advising team.

Duties of other staff & workers forming part of the emergency handling team are brought out in the Chapter developed for Emergency Action Plan. For team of key personnel to deal with emergency shall please refer **Annexures: 14, 15, 16, 17, 18**

3.4. Emergency Response Team

The role of Emergency Response Team members is to combat the emergency at the site and control the emergency situation and carry out rescue operations. This team will be working under direct control of Safety Lead/Fire Lead (ERT Leader).

ERT Leaders Will report and assist the Incident controller at Incident Site.

Duties of ERT Leader:

- Take control of the situation & coordinate the deployment of the ERTs arriving from various plants to the incident site in coordination with the Incident controller.
- Delegate to ERTs the required responsibilities to manage the emergency after acquiring information from the Incident controller.
- Ask the team to cordon the area to prevent entry of any other person other than the ERTs.
- Guide ERTs arrived from other plants to initiate and coordinate their first aid and evacuation activities as per the requirement of the situation.
- Arrange all additional resources & equipment for firefighting & rescue operations.
- Guide the Fire Team Members to initiate actions with suitable Emergency equipment's with extinguishing media.
- To check the actions taken by ERT teams and ensure that all the actions should be safe.
- Injured personnel should be rescued safely and shifted to triage area for further treatment

All team members are thoroughly trained to deal with fires, explosions, chemical spills and atmospheric releases, first aid. As per priority list during emergencies, the activities will be carried out as per emergency control plan.
Refer Annexure -18 for more details

Emergency Personnel's responsibilities Outside Normal Working Hours of the Factory.

The duties of Shift In-charge & **team members** have been brought out in the emergency control plan. **All team members** after evacuating the area shall report to ECC/ Incident Place. The non-essential workers shall be evacuated from the plants if the need arises and this will be determined with the forcible rate with which incident may escalate. Non-essential workers shall assemble at the earmarked/specified point of assembly.

3.5 Assembly Points

The following points are identified as Safe Assembly Point and are marked/Displayed, boards are provided in the area.
Refer **Annexure - 16** for more details

Assembly Point 1: - In front of Plant Admin Building/ In Front of ECC
Assembly Point 2: - Near HT Switch Yard
Assembly Point 3: - In front of Central Store

Around 200 people can be accommodated in each of the assembly areas. Each assembly area shall be led by responsible Key person who shall be reporting the headcounts to ECC. Each assembly area Incharge shall ensure further actions as per the directions received from ECC.

3.6 Emergency Control Center

It is headed by Site EHS Team. which is readily accessible & with minimum risk, equipped with telephone facilities and other communications facilities needed. It has enough means to receive and transmit information and directions from Site main controller to incident controller and other areas. In emergency control center due to its safer location and advantage of easier accessibility, all necessary personnel protective equipment's firefighting extinguishers are stocked in sufficient quantity. List of Personnel Protective Equipment's kept in emergency control room is brought out in **Annexure- 21 B (2) & Refer for more details.**

Annexure-20 describes the means/Items available in ECC.

Emergency Number (ECC): 100
Emergency Number Security Gate: 323
Emergency number OHC: 101

Role of Emergency Control Center

In case of mishap or accident like fire, toxic gas leakage, explosion in the factory, The Emergency Control Center will be Office of Head- HSE

1. The telephone numbers are listed in Annexure 27 and 28
2. The plot plan indicating all the activities in the factory premises including that of storage's utility services, production area, administration, effluent treatment plant is kept for ready reference, showing the location of fire hydrant and firefighting aids.
3. The normal role of employees, work permits, gate entries and documents for head count, employees blood group, other information and addresses are available and the person.
4. Stationery required is available in the Emergency Control Center (ECC) and HOD EHS looks after it.
5. The requirement for personnel protective equipment and other material, like torches, has been worked out and the quantity required during emergencies is kept in the Control Room (ECC). The responsible person for maintaining the said requirement/inventory is HOD- HSE

3.7 Fire & Toxicity Control Arrangements:

All plants are well equipped with suitable numbers of firefighting and personnel protective equipment. The staff is trained regularly to handle the various emergency situations. Refer Annexure - 21 for more details.

3.8 Medical Arrangements

The availability of first aid facilities in sufficient quantity is always ensured. In case of emergency arrangements will be made to avail outside medical help immediately. Emergency transport facilities are available. **Refer Annexure - 22 for more details.**

Medical Services

The company has established a full-fledged occupational health center (dispensary) with full time medical officer. Male nurse is available in factory premises 24 Hrs in a day and seven days a week. Necessary medicines and anti-dotes have been provided in dispensary and Inventory of the same is maintained. The company has also provided Ambulance in the campus.

For further treatment of injuries, the injured person shall be sent to Accord Hospital Bhuj, Patel Hospital Bhuj Government Hospital- Nakhatrana and other hospital where our mutual aid has been Tie-off.

Hospital

All Hospital have available all the facilities for treatment of serious cases and are well equipped with following:

- X-Ray facilities, Pathological Laboratory.
- Well Equipped operation theatre and facilities to carry emergency surgery.
- Blood grouping facilities and Blood Bank.
- The hospital has all the necessary specialists and medical staff with different wards and hospitalization.

3.9 Transport & Evacuation, Mutual Aid Arrangements:

Transport & Evacuation and Mutual Aid arrangements are available in the factory.
Refer Annexure - 23 for more details.

3.10 Pollution Control Arrangements:

Please refer to 2.5 for Non-toxic effluent treatment details.
Refer Annexure - 24 for more details.

QC Department closely monitors air pollution. In case of any abnormality, remedial measures will be taken immediately. The effluent stream generated in the process plants are Neutralized by Lime. The Relevant parameters PH, BOD, COD etc. are closely monitored.

3.11 Geographic Features

The Hajipir plant of Archean Chemical Industries Limited is in the Kutch district of Gujarat, India. The plant's geographical location places it in a strategic industrial zone near the coast, offering several advantages related to Brine Water, and away from a Populated Area.

Key Geographic Features:

1. Proximity to the Arabian Sea: The plant is situated relatively close to the coast, providing easy access to sea routes. This is particularly beneficial for the export of finished Products, such as bromine and industrial salts, produced at the plant.

2. The coastal location also aids in maintaining a steady supply of seawater, which is essential for the production processes of various chemicals.

Kutch Region:

1.The Kutch district is known for its arid and semi-arid climate, with extreme temperatures in both summer and winter. This climate is advantageous for certain industrial processes, particularly for salt production and Brine Concentration, as the high evaporation rates due to heat make it suitable for salt crystallization.

2. Kutch is also famous for the Rann of Kutch, a seasonal salt marsh, further contributing to the availability of salt as a raw material.

Industrial and Port Connectivity:

1.The Hajipir plant benefits from good connectivity to the nearby Mundra and Kandla ports, which are two of India's major seaports. These ports facilitate the easy export of chemicals to international markets.

2. Road networks are well-developed in the region, offering reliable connections to other industrial hubs in Gujarat and the rest of India.

Meteorological Data for Archean Chemical Industries Limited Ltd. Area

Meteorological data for Archean Chemical Industries Limited, Hajipir can be gathered from nearby weather stations or sources that provide regional climatic information. The key aspects of the meteorological data for the Hajipir site, situated in Kutch district, Gujarat, are described based on the general climate patterns of the region.

1. Temperature:

- Summer (March to June): Extremely hot, with maximum temperatures ranging between 35°C to 45°C.
- Monsoon (July to September): Moderate temperatures, ranging between 30°C to 35°C, but with some cooling due to cloud cover.
- Winter (November to February): Cooler, with temperatures dropping to 15°C to 25°C, and at night, it may drop below 10°C.

2. Humidity:

- Summer and Winter: The humidity remains relatively low, ranging from 20% to 50% due to the arid nature of the Kutch region.
- Monsoon: During the rainy season, humidity levels rise significantly, reaching 60% to 80%, especially when influenced by moisture-laden winds from the Arabian Sea.

3. Rainfall:

- Annual Rainfall: The region experiences low rainfall, with an average of 300 mm to 400 mm annually.
- Monsoon Period: Most of the rainfall occurs between July and September, with sporadic showers. The region is prone to brief but intense rainfall due to the influence of the South-West Monsoon.
- Drought Conditions: The Kutch area, including Hajipir, often faces drought conditions due to the highly erratic and inconsistent nature of the rainfall.

4. Wind Patterns:

- Pre-Monsoon and Summer Winds: Strong hot winds blow from the northwest to the southeast. Winds can reach speeds of 20 to 30 km/h, creating dusty conditions.
- Monsoon Winds: During the monsoon season, winds typically shift direction, blowing from the southwest, bringing moisture from the Arabian Sea.
- Winter Winds: During winter, the winds are generally calmer and originate from the northeast, with speeds ranging from 5 to 15 km/h.

5. Visibility:

- Dust Storms: Due to the dry and arid landscape, especially in the summer, the region experiences frequent dust storms, reducing visibility and affecting operations.
- Fog: Rare occurrences of fog during the cooler months may slightly reduce visibility, but these events are uncommon.

6. Pressure:

- Average Atmospheric Pressure: The region generally experiences an atmospheric pressure of around 1010 to 1015 hPa, with minor variations due to seasonal shifts.

6. **Sunshine Hours:**
    - High Sunshine Hours: The site receives abundant sunshine, with approximately 8 to 10 hours of sunlight per day for most of the year, except during the monsoon season, when cloud cover reduces sunlight.

8. Seismic Activity:

- Seismic Zone: The Kutch region, including Hajipir, is part of seismic zone V, which indicates a high risk of earthquakes. Special structural considerations need to be made for industrial sites in this area.

CHAPTER 4
COMMUNICATION SYSTEM

4.1 Declaring the Emergency

In case of any emergency in the company, speedy and effective communication of the same to all concerned in the least possible time is the most important aspect of any emergency-handling plan. An early communication increases the chances of control of emergency in the bud stage. Blowing siren has been adopted as method of communication of emergency, to all employees in the company.

Types of Sirens

Three different types of sirens have been identified for communication in emergency.

- **Disaster Siren**: Sounds for 30 seconds, followed by a 10-second pause, repeating for 2 cycles.
- **All Clear Siren**: Sounds continuously for 90 seconds.
- **Fire Siren**: Sounds for 15 seconds, followed by a 5-second pause, repeating for 3 cycles.
- **Test Siren**: Sounds for 90 seconds every Saturday at 11:00 AM.

Siren Location: The main siren is installed above the SOP Building to ensure wide coverage across the entire campus. Additionally, low-range sirens have been installed at the following locations: (a) Washery Plant and (b) FES Plant. The siren switch is in the Control Room.

A hand-operated siren is located at the Main Security Gate. The Head of HSE (Health, Safety, and Environment) is responsible for maintaining the electric call bell, while the Manager of Security and Administration is responsible for the upkeep of the hand-operated siren.

A CO_2 flooding system has also been installed in the 66 kV HT switchyard for fire protection.

PA system is also provided in the Company. The numbers can be dialed through telephone and PA system can be utilized for communication.

Refer **Annexure: - 26 for more details on Siren system**

Raising Alarm

Any person noticing any emergency in the company should immediately call to Emergency control room with following information:

i. Identify oneself

ii. State briefly the type of emergency i.e. whether fire, explosion, toxic gas release etc.
iii. Give the location of the incident
iv. Estimated severity of the incident.

ECC Call operator after ensuring genuineness of the call shall inform to security control room for raise the ALERT SIREN. At the same time, he will also contact the incident controller and ECC in order to inform them about the incident. He will keep the gate open and rush his two security personnel to the site of emergency.

ECC shall be immediately manned on hearing alert siren. If the authorized people to handle ECC are not available, any senior most people out of the available person nearby shall occupy ECC till authorized person comes.

Incident controller and ERT team, on hearing alert siren or by any other way of information of the emergency, will immediately reach at the site of incident and assess the situation. Incident controller will immediately give his feed back to ECC. ECC shall direct security gate to raise evacuation siren, if the need arises.

SIREN FOR EVACUATION shall be raised on instruction from Site Main Controller or any Manager of the company in the ECC.

ECC Person is authorized to raise ALL CLEAR SIREN on instruction from Site Main Controller or ECC, after the emergency is over.

Incident controller shall assume the responsibility of site main controller in his absence

Internal Communication
For internal communication refer **Annexure: - 30**

It shall be the responsibility of ECC to communicate with all employees in the company. They may get help from a telephone operator for such communication. However, telephone operator can directly communicate information about emergency to all internal departments, if such message comes from incident controller or site main controller. The telephone operator will continue to operate the switchboard advising the callers that staffs are not available and pass all calls connected with the incident to ECC. The list is also enclosed as Annexure -27. It shall be ensured by ECC that if mass communication is required, the PA system shall be effectively utilized.

Availability of Key Personnel outside Normal Working Hours

The details of key personnel availability after working hours are made available at Security Gate, ECC, telephone operator as well as production units. Security personnel shall call required key personnel from their residence in case an emergency occurs outside normal working hours. Availability of emergency vehicle / Ambulance is ensured to fetch the key personnel residing outside. It is the responsibility of Site HR to maintain it.

To the Outside Emergency Services
Decision to call outside help to deal with emergency like fire brigade, ambulance, police, etc., shall be taken by Site Main Controller. However, in absence of Site Main Controller, if the incident controller realizes the need to call outside help, he may ask for immediate help from outside. ECC is responsible for calling help from outside. A list of emergency services available in the area with their telephone numbers is provided at ECC, at Security gate and with telephone operator. The list is also enclosed as **Annexure -28**. Facilities such as phones, emergency vehicle, security personnel are available to help calling outside emergency services and authorities.

4.2 Communication to the Authorities

The emergency will be immediately communicated to the government officers and other authorities such as GPCB, police, district emergency authority, Factory Inspectorate, hospital etc. by Emergency Control Centre

To Neighboring Firms & the General Public
In case of emergency having its outside impact, public will be cautioned regarding the same through public address system, personal visits and talks with community in the affected area. Co-ordination of administration will be sought for speedy action. This is to be ensured by ECC.

4.3: Communication to Customer

In the event of a fire, explosion, release, or damage to facilities, the information shall be promptly communicated to customers, stakeholders, and relevant statutory authorities.

CHAPTER 5
EMERGENCY AND ACTION ON SITE

5.1 TYPES OF EMERGENCIES:

a. Flammable material release and Fire
b. Toxic and Corrosive Release
c. Flood
d. Earthquake
e. Cyclone

5.2 Co-related Activities

A. Pre-emergency activities

Internal Safety survey regarding identification of hazards, availability of protective equipment's, checking for proper installation of safety devices is carried out periodically.

- Periodic pressure testing of equipment
- Periodic pressure testing of lines.
- Periodic safety/relief valve testing
- Periodic fire hydrant system testing.
- Mock drill to check up level of confidence, extent of preparedness of personnel to face emergency is being contemplated.
- Regular training is being imparted to all personnel to create awareness.
- Adequate safety equipment's are made available.
- Periodic checkup of emergency lights.
- Safer assembly points are identified.
- Storage of adequate first aid treatment facilities.
- Statutory information is imparted to workers.
- Community awareness program on hazard communication and Emergency preparedness

Emergency time activities

During emergency all personnel will work with specific objective in co-ordination with the Site Main Controller to tackle the situation.

5.3 Controlling Emergency

a. Flammable Releases.

If the fire occurs:

- Put on the emergency siren switch at once when the fire is noticed.
- Put off electrical mains for the plant wherein fire is observed, connected ECR's for the plant should be put off.
- Some of the members of ERT crew to carry Fire Appliances to incident place
- ERT crew to be directed for immediate actions in the area for extinguishing the fire by use of fire extinguishers and water from fire hydrant posts.
- Simultaneously put off the source of gas emission.
- Pollution Control team to monitor gas emissions in the surrounding
- Steps to be taken to evacuate non-essential persons.
- Use of portable fire extinguishers like foam type, ABC type to be made to contain the solvent fire.

- Use of water to be made to extinguish the fire and cooling off the equipment and storage surface till the fire extinguished and equipment's are cooled.
- In case of Carbon dioxide extinguisher used, do not allow the persons to enter the area till the time, the carbon dioxide is dispersed and diluted to avoid any suffocation.
- To put off the fire due to solvents make use of excessive foam/DCP/ABC type fire extinguishers & water fog. Make use of excessive water to cool the surface area of equipment.
- Provide gas masks, Goggles, Aprons, Helmets and safety wears to the firefighting team.
- Keep people away from the danger area.
- Do not permit any naked flame and smoking in the area.
- Stop leakage and flush the leaky liquid, don't allow flow the leaky liquid in the drain.
- Give first aid to the injured persons.
- If necessary, induces vomiting, gives artificial respiration and the affected person should be sent to the nearest doctor/clinic.
- Inform neighboring industries and population, if feel like doing so.
- Contact fire brigade, Police, Doctor/Hospital and other authorities as per need.
- Contact statutory authorities and give information.

These are the guidelines for emergency planning for gas leak/fighting the fire and it is assumed that cooling efforts should be 100% effective then the same shall be exercised effectively by emergency response team before any vessel deformation and bulging takes place.

Refer **Annexure: – 21** for more details.

5.4 Additional Actions for Leader of ERT.
A roll call shall be held of persons present at the assembly point to establish whether anybody is missing. The shift in-charge will communicate with ECC to organize search, if anyone is missing.

Action After Fire:
The person in charge shall:
a. Prepare immediate abnormal occurrence report as soon as possible and submit it to personnel department/administration department.
b. The affected department head shall carry out an investigation and prepare a detailed report mentioning any further requirement of facilities for tackling such type of emergencies.
c. Before the plant is re-commissioned the mechanical/electrical/instrumentation shall assess the danger to ensure equipment is safe for continued services.
d. Make a note of the fire extinguisher used and need replacement.

Fire Service
Adequate numbers of portable fire extinguishers are placed in the production plant, utility building, storage, Ware house, Formulation and other operating areas. Plant wise chart of installation of fire extinguisher is available at main security gate & ECC. The wet fire hydrant system is in operation. Also 27 ERT members are available in premises having facility like CO2 fire extinguisher, DCP Powder and Foam Extinguishers.

For details on Fire Hydrant System and Fire Service appliances, please refer **Annexure 21**

ERT:
All persons from the Plant, Utilities, Administrations, Stores, Maintenance and Security Department are trained for emergency response and are listed in Annexure as essential worker. Wherever emergency occurs ERT members rush for handling situation after handing over charges to nominated person by shift in charge. They shall be reported at ECC after hearing evacuation siren. The leader shall be among members according to their seniority level and skill. SMC/IC shall be communicated emergency situation, and they will act accordingly.

Please refer **Annexure: 18** for details

First Aid-Trained Persons other than ERT members
Four Trained mail nurses look after the dispensary on a 24 Hrs regular basis, Various Employees have also been trained for first aid treatment. The details can be referred in **Annexure: 18**

Personal Protective Equipment:

Safety Helmet and Safety Shoes are to be used by all employees during emergency. For PPEs quantity and place of accessibility, please refer to **Annexure: 21-B (2)** and further details.

The PPE trolley is to be carried to place of Incident by designated persons from ERT

b. Toxic releases.

If gas leaks

- Put on emergency siren when toxic vapors/gas leakage is noticed.
- Try to close the necessary valves to stop the gas leakage.
- Call the team respond crew to take immediate action to curtail the gas emission and spread up by use of water or appropriate medium (water in the form of fog will reduce the concentration of acidic vapors in the surrounding).
- Keep people and neighbors who can get affected away from the danger area.
- Do not permit naked flame or smoking in the area.
- After stopping the leakage flush the area with ample water and send the contaminated water to ETP.
- Give the first aid to the injured persons.
- Bring the patient to the fresh air, give the victims oxygen for sufficient time and transport to external health care facility if required.

Refer **Annexure – 19** for more details.

c. Fire /Toxic gas release due to Explosion/Rapture

Explosion may take place due to over pressurization in reactor, or mixing of incompatible material, etc. may lead to fire or toxic gas release or impact on structure, human injury, collapse equipment, structure, environment damage etc. If such things happen

Then activate siren and On-site emergency plan will activate

If the fire occurs:

- Put on the emergency siren switch at once when the fire is noticed.
- Put off electrical mains for the plant wherein fire is observed, connected MCC's for the plant should be put off.
- Some of the members of ERT crew to carry Fire Appliances to incident place
- ERT crew to be directed for immediate actions in the area for extinguishing the fire by use of fire extinguishers and water from fire hydrant posts.
- Simultaneously put off the source of gas emission.
- Pollution Control team to monitor gas emissions in the surrounding
- Steps to be taken to evacuate non-essential persons.
- Use of portable fire extinguishers like foam type, ABC type to be made to contain the solvent fire.
- Use of water to be made to extinguish the fire and cooling off the equipment and storage surface till the fire extinguished and equipment's are cooled.
- In case of Carbon dioxide extinguisher used, do not allow the persons to enter the area till the time, the carbon dioxide is dispersed and diluted to avoid any suffocation.
- To put off the fire due to solvents make use of excessive foam/DCP/ABC type fire extinguishers & water fog. Make use of excessive water to cool the surface area of equipment.
- Provide gas masks, Goggles, Aprons, Helmets and safety wears to the firefighting team.
- Keep people away from the danger area.
- Do not permit any naked flame and smoking in the area.
- Stop leakage and flush the leaky liquid, don't allow flow the leaky liquid in the drain.
- Give the first aid to the injured persons.
- If necessary, induces vomiting, give artificial respiration and the affected person should be sent to the nearest doctor/clinic.
- Inform neighboring industries and population, if feels to do so.

- Contact fire brigade, Police, Doctor/Hospital and other authorities as per need.
- Contact statutory authorities and give information.

These are the guidelines for emergency planning for gas leak/fighting the fire and it is assumed that cooling efforts should be 100% effective then the same shall be exercised effectively by emergency response team before any vessel deformation and bulging takes place

If Toxic gas release, then

- Put on emergency siren when toxic vapors/gas leakage is noticed.
- Try to close the necessary valves to stop the gas leakage.
- Call the team respond crew to take immediate action to curtail the gas emission and spread up by use of water or appropriate medium (water in the form of fog will reduce the concentration of acidic vapors in the surrounding).
- Keep people and neighbors who can get affected away from the danger area.
- Do not permit naked flame or smoking in the area.
- After stopping the leakage flush the area with ample water and send the contaminated water to ETP.
- Give the first aid to the injured persons.
- Bring the patient to the fresh air, give the victims oxygen for sufficient time and transport to external health care facility if required.

. The people will be evacuated from the vicinity & safe shutdown of system will be taken up. In case of release of above liquid/vapors in high concentration the Site Main Controller will co-ordinate the activities with incident controller. Under his direction, plant will be shut down. Non-essential workers will be sent to assembly points.
Refer **Annexure – 19** for more details.

Post emergency activities:

Following post emergency actions are carried out to study in detail and preventive measures to be taken.

- Collection of records.
- Inquiries
- Insurance claims
- Preparation of reports comprising suggestion and modification.
- Rehabilitation of affected personnel.
- Normalization of plant.

5.5 Use of Mutual Aid

Mutual aid agreement with M/S Neelkanth.

5.7 Medical Treatment

The affected personnel will be brought to safer place immediately to give them first aid. Immediate medical attention will be sought.

5.8 Accounting for Personnel

Proper accounting for personnel as laid down in all the shifts. The number of persons present inside the plant premises, their duty etc. will be available with the P & A. This record will be regularly updated and will be made available.

5.9 Access to Records

The relatives of affected personnel will be informed. The details regarding all employees are made available to the Administration building.

5.10 Public Relations

In case of emergency, Manager P & A will be available for official release of information pertaining to the incident.

5.11 Rehabilitation

The affected area is cleared from emergency activities only after positive ascertaining of the system in all respects. The entry to affected area will have to be restricted until statutory authorities visit and inspect the spot of incident. Nothing should be disturbed from the area till their clearance. The site main controller will be in charge of the activities to be undertaken.

The plan will cover emergencies, which can be brought under control by the works with the help of emergency team/fire services. The DISASTER CONTROL PLAN for gas leak and fire has been prepared for entire factory.

5.12 Causes of Emergency:

Risk

A. Nature

In Archean Chemical Industries Limited Ltd, plant the nature of dangerous events could be of the following:

FIRE : Chemical/Electrical/Gas
TOXIC RELEASE : From chemicals & gases.
LEAKAGES : Equipment, pipe lines, safety valves, etc.

Release of Toxic Like. Bromine and Chlorine.

Large spillage to ground floors resulting in pollution & fire.

Failures of Equipment / Instruments.

Release of safety valves or ruptures of vessels due to excessive pressures.

B. Various Emergency Actions

a. Onsite

i. Safe shut down of the plant and utilities.
ii. Emergency control measures.
iii. To attempt with the help of trained crew in fire fighting to contain the fire spread up/gas emission and limit within limited space.
iv. To cut off source of oxygen by use of fire fighting appliances/to cut off source of gas emission.
v. Cut off fall sources of ignition like electrical gadgets.
vi. To protect fire prone area from the fire.
vii. To remove material which can catch fire to the extent possible from fire prone area.
viii. Evacuation of non-essential persons.

Note: Emergency instruction booklet is brought out in **Annexure-33**

b. Medical Facilities/Treatment

i. Company had a Health center which is manned with trained male nurse on continuous basis who can render medical first aid. Two nos. qualified Doctor covering two shift full time
ii. Further immediate medical help is available in Nakhatrana and Bhuj City Hospital.
iii. Depending on seriousness the injured person shall be shifted to any other hospital as suggested by Dr A K Patel.
iv. Vehicle is available round the clock for transportation. Ambulance is also made available in the campus on regular basis.

Refer **Annexure -22** for more details

c. In the event of Fatal Accidents

The information shall be given to following:

Authorities	Location
Inspector of Police	BHUJ
Inspector of Factories	ADIPUR
Mamlatdar	BHUJ
Corporate Office	CHHENAI
Regd. Office	BHUJ
Insurance Company	
Regional Officer, GPCB	BHUJ

For telephone Nos. please refer **Annexure: 28**

d. Emergency Siren

Emergency siren shall be blown for announcing the emergency which shall have different sound for identification/differentiation than the normally used for commencement of factory working etc.

e. Advise for vacation of other areas

Since the effect of fire/gas emission shall be contained within the area of the plant advice of vacation of other areas is not necessary.

C. Emergency Facilities Existing in the Plant:

I) Fire Fighting:

The portable firefighting equipment available in the plant are detailed out in **Annexure-21 B**.

Fire hydrant system is being provided around the plant and the installation relates to adequate capacity of water storage tank. The details are referred in **Annexure: 21 A**

II) Security Personnel:

Security personnel have been trained to take care of any traffic inside the plant, however for control of traffic,

III) Medical Services:

- First aid facility is available in the company dispensary with trained personnel to give first aid treatment round the clock.
- For further treatment the injured person will be shifted to Doctor located at G. K General Hospital Bhuj, Govt. Hospital Nakhatrana and Accord Hospital Bhuj.
- If the injured person is serious, he will be shifted to Bhuj District Hospital

D. Response Time-Minutes

Hazard	Firefighting	Police	Medical Services
Fire & Explosion Immediate with Available Facilities with the plant			
External Help	120 Minutes	30 Minutes	120 Minutes

CHAPTER 6

OFF-SITE EMERGENCY PLAN

6.1 Need of The Site Emergency Plan

Depending upon the wind direction and velocity of the effects of accident in factory may spread to outside its premises. To avert major disaster it is essential to seek guidance/assistance of statutory authorities, police and health department. The movement of traffic may have to be restricted.

Required information will be given to the authority and consultation will be sought for remedial measures

.

A purpose of the off-site emergency plan is:

a. To provide the local/district authorities, police, fire, brigade, doctors, surrounding industries and public the basic information of risk and environmental impact assessment and appraise them of the consequences and the protection/prevention measures and to seek their help to communicate with public in case of major emergency.

b. To assist district authorities for preparing the off-site emergency plan for district or particular area and to organize rehearsals from time to time and initiate corrective actions on experience.

6.2 Structure of the Off-Site Emergency Plan

Available with concerned authorities.

6.3 Role of the Factory Management

The site main controller will provide a copy of action plan to the statutory authorities in order to facilitate preparedness of district/area off-site emergency plan.

6.4 Role of Emergency Co-ordination Office (ECO):

He will be a senior police or fire officer co-ordination with site main controller. He will utilize emergency control center.

6.5 Role of Local Authority:

Preparation of Off Site Plan lies with local authorities. An emergency-planning officer (EPO) works to obtain relevant information for preparing basis for the plan and ensures that all those organizations involved in offsite emergency and to know their role and responsibilities.

6.6 Role of Fire Authorities:

The fire authorities will take over the site responsibility from incident controller after arrival. They will be familiarized with site of flammable materials, water and foam applies points, firefighting equipment.

6.7 Role of the Police and Evacuation Authorities:

Senior Police Officer designed, as emergency co-ordination officer shall take over all control of an emergency. The duties include protection of life, property and control of traffic movement.
Their functions include controlling standards, evacuating public and identifying dead and dealing with casualties and informing relatives of dead or injured.
There may be separate authorities/agencies to carry out evacuation and transportation work.
Evacuation depends upon the nature of accident, in case of fire only neighboring localities shall be alerted. Whole areas have to be evacuated in case of toxic release.

6.8 Role of Health Authorities

After assessing the extent of effect caused to a person the health authorities will treat them.

6.9 Role of Mutual Aid Agencies

Various types of mutual aid available from the surrounding factories and other agencies will be utilized.

6.10 Role of Factory Inspectorate

In the event of an accident, the Factory Inspector will assist the District Emergency Authority for information and helping in getting Neighboring Industries/mutual aid from surrounding factories.

In the aftermath, Factory Inspector may wish to ensure that the affected areas are rehabilitated safely.

6.11 Public Relations

Head P & A will be available dealing with Media, Administration and for official release of information pertaining to the incident. He will also appoint Head of CSR activities to remain in touch with the community persons who are likely

to get affected. Head EHS shall be in continuous touch with Mutual Aid agencies, Pollution control Board or DISH authorities.

6.12 Rehabilitation

The people likely to get affected shall be identified and shall be rehabilitated to safe place under the direction of district administration as identified in Off-Site Emergency Plan. Such shelters identified in the surrounding areas are Hotel Navjeevan and Sanman which has capacity to accommodate about 600 people.

6.13 Offsite Mandatory Information

Stakeholders and Their Responsibilities

At the district level, District Collector is responsible for responding any disaster situation in consultation with other line departments at district Head Quarters (HQ) is responsible to deal with all phases of disaster management within the district. Technical institutions, Non-Governmental **Organizations (NGOs), Local** authority, the private sector, community groups, volunteer agencies, and citizens are the other stakeholders and potential participants in the disaster management exercise.

According to DM Act, 2003 Stakeholders and their responsibilities are:
District Collector
During the period, when an area is declared or considered as an affected area the Collector may issue directions to the officers of the departments of the Government and the local authority in the affected area, to provide emergency relief in accordance with the DDMP or another contingency plan.

The District Collector may decide on the release and use of available resources. The District Collector may also control and restrict traffic to, from and within the area affected by a disaster. He or she may control and restrict the entry into, movement within and departure from any disaster area or part of it. Other activities which may be ordered by the collector are –

a. Removal of the debris
b. Conduct search and rescue operations
c. Make arrangements for the disposal of the unclaimed dead body, by appropriate means
d. Provide alternative shelter
e. Provide food, medicines and other essentials
f. Require experts and consultants in the matters relevant to the disaster to provide relief under his direction and supervision
g. To take possession and make use of any property, vehicles, equipment, buildings, and means of communication on such terms and conditions as may be prescribe
h. Procure exclusive or preferential use of amenities as and when required
i. Construct temporary bridges or other structures
j. Demolish unsafe structures which may endanger the public
k. Coordinate with non-governmental organizations and ensure that such entities carry out their activities in an equitable manner
l. Disseminate information to the public to deal with the disaster
m. Direct and compel evacuation, of all or part of the population from any affected area for the purpose of preservation of life and for such evacuation, and for such evacuation use such force as may be necessary
n. Authorize any person, to make an entry into any place, to opener cause to be opened, any door, gate or other barrier, if he or she considers such an action is necessary for preservation of life andproperty, if the owner or occupier is absent, or is present, refuses to open such door, gate or barrier.

Rainfall details of Site (1999 to 2020)

Year	Bhuj	Bhachau	Rapar	Nakhatrana	Lakhpat
1999	123	273	189	10	**65**
2000	90	11	18	63	**185**

2001	243	382	339	456	**294**
2002	78	164	231	100	**58**
2003	712	599	686	922	**843**
2004	223	275	416	201	**253**
2005	188	403	491	174	**98**
2006	596	378	532	655	**656**
2007	663	611	570	580	**442**
2008	247	289	333	319	**198**
2009	421	389	462	432	**383**
2010	896	968	949	691	**375**
2011	742	881	1056	634	**415**
2012	140	182	277	380	**290**
2013	472	951	865	330	**189**
2014	230	320	185	241	**140**
2015	591	684	646	649	**434**
2016	224	416	391	389	**291**
2017	320	449	656	367	**330**
2018	83	103	26	70	**12**
2019	595	798	883	841	**633**
2020	**1359**	**986**	**897**	**1012**	**810**

Hazard Vulnerability and Risk

Hazards are defined as “Phenomena that pose a threat to people, structures or economic assets and which may cause a disaster. They could be either man-made or naturally occur in our environment.” A Disaster is the product of a hazard coinciding with a vulnerable situation, which
might include communities, cities or villages. The Vulnerability is defined as “the extent to which a community, structure, service or geographical area is likely to be damaged or disrupted by the impact of particular hazard, on account of their nature, construction, and proximity to a hazardous terrain or disaster-prone area”.
The hazard mapping can be best done by officials in the field, line departments, specialized agencies like BISEG or GIDM, and Gujarat State Disaster Management Authority. Collector is the nodal officer which does such hazard analysis. Now a days technology like GIS and aerial surveillance by drones etc. can also be used for hazard mapping.
Risk and Vulnerability Ranking Analysis

All events or activities carry some risk and are associated with some level of vulnerability. Risk and vulnerability ranking is the process of assigning scores to the risk and possible impact of hazards to be able to compare the likely vulnerability and make informed management decisions about which hazards are of greatest concern and when planning and preparation efforts should be directed. A crude risk and vulnerability ranking process can be accomplished in five steps.

Disaster	**Year**	**Magnitude**	**Talukas & no. of villages affected**	**Life & cattle loss**	**Damage to property**	**Economic losses**
Earthquake	2001	/extent	10 Taluka	13805	146087 houses fully damage,278217houses	Around 448crore privet and
Cyclone	1998	4	884 Village Affected	4000	damaged to a variable extent.	public property
Flood	2011	4	Gandhidham, Mundra, Anjar	1 Death 41cattle loss	--	--
Heat wave	--	3	2 Taluka	--		18947 lakhs Rs.
Cold wave	--	--	200 village	--	--	--

Vulnerability Ranking

Probability Rating: Class and (score)	Impact Rating: Class and (score)				
	Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Almost certain (5)	Low-5	Moderate -10	Moderate -15	High-20	High-25
Likely (4)	Low-4	Moderate-8	Moderate -12	High-16	High-20
Moderate (3)	Low-3	Low-6	Moderate -9	Moderate -12	Moderate -15
Unlikely (2)	Low-2	Low-4	Low-6	Moderate -8	Moderate -18
Rare (1)	Low-1	Low-2	Low-3	Low-4	Low-5

Hazard Risk Vulnerability

Hazard	Probability	Impact	Vulnerability Rating (Probability times Impact)	Specific Locations andpopulations of concern
Earthquake	4	5	20 (High)	Whole Kutch district come underZone V Bhachau, Rapar, Bhuj and Anjarare more vulnerable
High Wind and Sea Surge(Cyclone)	4	4	16 (High)	Bhachau, Gandhidham, Anjar, Mundra, Mandavi, Abdasa andLakhpat are more vulnerable
Tsunami	4	3	12 (Moderate)	Coastal Talukas like Mundra, Mandvi, Gandhidham, Bhachau, Anjar, Lakhpat

Flood	1	2	1 (Low)	May occur due to very heavy rainfall, sea surge or tsunami
Industrial Accident	3	4	12 (Moderate)	Gandhidham, Anjar, Bhachau, Mundra are more vulnerable dueto closeness to industrial units
Drought	4	3	12 (Moderate)	Whole district
Heat wave	4	2	8 (Moderate)	Whole district
Cold wave	3	2	6 (Low)	Naliya, Bhuj, Mandvi, Lakhpat
Landslides Mudflows	1	1	1 (Low)	---
Dam Failure	1	2	2 (Low)	District does not have any major dams
Mine fires/collapse	2	1	2 (Low)	Pandro coal mines
Road/rail/airaccident	3	3	9 (Moderate)	Surajbariya, Chiray village, National Highway, Bhuj toPandro highway
Oil spill (marine)	2	4	8 (Moderate)	Sea shore, coastal belt of Kandla, Mandvi, Mundra.
Boat Sinking	2	2	4 (Low)	Kandla, Mandvi, Mundra, Jakhau port
BuildingCollapse	3	2	8 (Moderate)	Bhuj, Gandhidham, Anjar, Bhachau, Rapar, Mundra,Mandvi City area
CommunalDisease (epidemics)	3	3	9 (Moderate)	Banni area and Vagad area
Food poisoning	3	3	9 (Moderate)	Whole district
Animal disease (epidemics)	2	3	6 (Low)	Bhuj Taluka, Banni area, Gada area of Abdasa taluka
Terrorism	2	4	8 (Moderate)	Land and costal International border area
Critical Infrastructure Failure (e.g. extended power outage)	3	3	6 (Low)	Oil pipe lines, road infrastructurein the district
Civil Unrest	1	1	1 (Low)	Relatively peaceful district
War	2	5	10 (Moderate)	Whole district

Probability Period/Seasonality of Disasters

Type of hazard	Time of Occurrence	Potential Impact
Flood	June to September	**Loss of life, livestock, crop, and infrastructure**
Epidemics	Anytime	**Loss of human life**
Fire Accidents	Anytime	**Human Loss and house damage**
Earthquake	Anytime	**Loss of Life, Livestock, and Infrastructure**
Cyclone	April to May October to November	**Loss of Life, Livestock, and Infrastructure**
Drought	July-October	**Damaged to crops**
Biological Hazard	**Anytime**	**Loss of human life & livestock**

List of Hazards with Probablity (frequency and magnitude) to be addressed in this

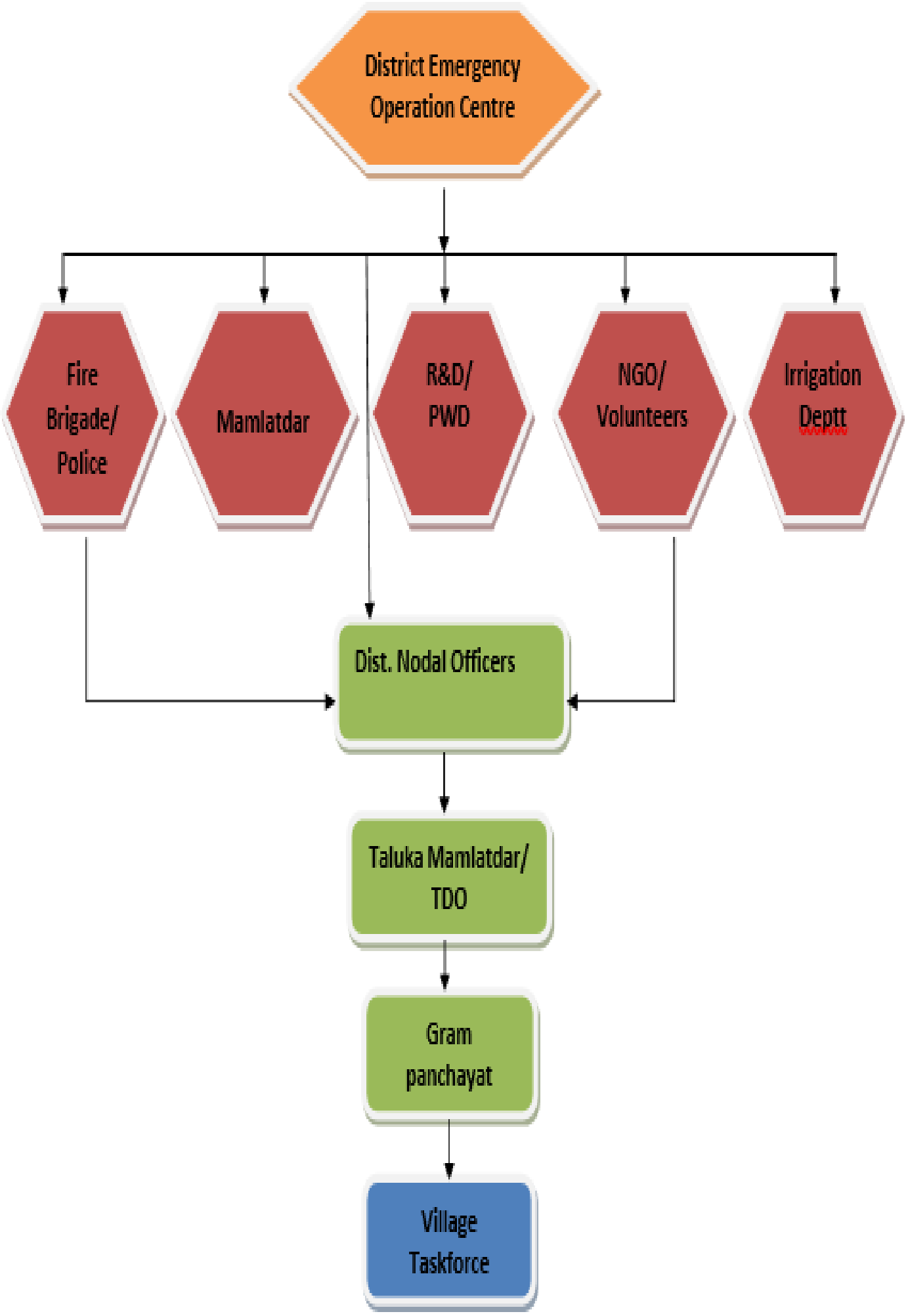
Probability of Occurrence of disaster												
Type of Hazard	**Time period**											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**June**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Earthquake												
Cyclone												
Flood												
Tsunami												
Fire												
Heat Wave												
Biological Hazard												

District Incident Command Structure-Key

Sr. No.	Taskforce	Taskforce Operation Room/Contact Number	Taskforce leader/Contact Number	TASKFORCE-AlternateLEADER /Contact Number
1	Incident Commander	District Collector	9978406213	9978405212
2	Alternate Incident Commander	Resident Additional Collector	9978405212	--
3	Warning and Communications	RAC Office	RAC 02832 250650 09978405212	Mam. Disaster Management 9537798343 02832-252347
4	Law & Order	Police ControlRoom (CR)	DSP 02832 250444 9978405073 9978405690	Dy. SP 02832 250444 F: 02832 250427
5	Search & Rescue	Dy. Collector CivilDefense	Chief fire Officer or Deputy Collector (CivilDefense)- 02832230603	District Municipality officer
6	Public Works	R&B-CR	Ex. Engr, R&B02832-251450 9824340099	Dy. Engr. 02832-221103
7	Shelter	Primary Education. Office-CR	District Primary Edu.Officer 02832 250156 9909971683	Dy. District Primary Edu. Officer 02832 250156
8	Water Supply	GWSDB-CR	Ex. Engr. GWSDB 9978406534	Ex. Engr. GWSDB
9	Food & Reliefsupplies	DSO-CR &DDO office	District Supply Officer02832-221453 9408308508	Dy. DDO officer98798 90124
10	Public Health & Sanitation	District Health Centre,	CDHO 02832-252207	Add. CDHO 02832 252207
11	Power	PGVCL	Supt. Engr. GEB02832-253550 9979867510 9879200789	Ex. Egg. GEB02832-253752

Forecasting and Warning Agencies

Sr. No.	Disaster	Agencies
1	Earthquakes	IMD, ISR
2	Floods	IMD, Irrigation Department
3	Cyclones	IMD
4	Tsunami	IMD, ISR, INCOIS
5	Drought	Agriculture Department
6	Epidemics	Health and Family Welfare Department
7	Industrial & Chemical Accidents	Industry, Laborand Employment Department, DISH
8	Fire	Fire and Emergency Services


District Emergency Operation Centre
Fire Brigade/ Police
Mamlatdar
R&D/ PWD
NGO/ Volunteers
Irrigation Deptt
Dist. Nodal Officers
Taluka Mamlatdar/ TDO
Gram panchayat
Village Taskforce

List of Wireless stations to be installed during monsoon by State Government

Sr. No.	Name of wireless stations	Name of Section Officer	Mob. Number
1	Flood Cell Bhuj (KIC)	Name as per duty allotted	9638252507
2	Tappar	Shri V. V. Damor	9825730674
3	Godhatad	Shri M. R. Aasari	9925118325
4	Sanandro	Shri M. R. Aasari	9925118325
5	Rudramata	Shri J. M. Dholu	7020913966
6	Nara	Shri D. M. Chaudhari	9586890030
7	Niruna	Shri A. K. Bhanat	7359363702
8	Bhukhi	Shri B. V. Sadhu	9586768069
9	Kankawati	Shri A. A. Sangar	9726680785
10	Mathal	Shri U. H. Chaudhari	9586757535
11	Kaila	Shri H. B. Aayar	9825662737
12	Suvi	Shri M. N. Gamit	8141115955
13	Kaswati	Shri J. M. Dholu	7020913966
14	Gajod	Shri D. M. Maheshwari	9016883336
15	Jangdia	Shri P. R. Bangal	8849672271
16	Fatehgadh	Shri M. N. Gamit	8141115955
17	Berachia	Shri M. M. Barajod	9586818189
18	Gajansar	Shri A. N. Patel	9723159431
19	Kalaghogha	Shri K. N. Prasanvi	9099194907
20	Don	Shri A. A. Rajgor	8140015977
21	Mitti	Shri P. R. Bangal	8849672271

Satellite website for storm prediction

http://en.allmetsat.com/images/asia/.php http://en.allmetsat.com/images/met5_cimss_irc.php http://manati.orbit.nesdis.noaa.gov/dataimages21/cur/zooms/WMBas49.png
http://cimss.ssec.wisc.edu/tropic/real-time/indian/images/xxirmet5n.GIF http://cimss.ssec.wisc.edu/tropic/real-time/indian/images/xxwvmet5.GIF http://www.imd.ernet.in/main_new.htm
http://www.sat.dundee.ac.uk/abin/geobrowse/IODC/2007/8/7/600

History of past disasters in District

Disaster	Year	Magnitude /extent	Talukas & no.of villages affected	Life & cattle loss	Damage to property	Economic losses
Earthquake	2001	4	10 Taluka 884 Village Affected	12216	146087 housesfully damage, 278217 housesmedium damage infrastructureswere damaged to avariable extent.	around 448 crore privet and public property
Cyclone	1998	4	Gandhidham, Mundra, Anjar	---	---	----
Flood	2011	4	2 taluka 200 village	1 life 41 cattle loss		18947 lakhsRs.
Heat wave	--	--	--	--	--	--
Cold wave	--	--	--	--	--	--
Industrial disaster	--	--	--	--	--	--

List of resources available in district Life Jacket, Life buoy, Ropes etc

Sr. No.	Name oftaluka and office	Lifejacket	Lifebuoy	Pp ropes 26mm100ft	Pp ropes 26mm200ft	PortableInflatable Emergency Lighting	Generator
1	Collectoroffice	49	49	8	2	3	1

2	DSP office	18	4	2	1	21	1
3	DDO office	2	2	1	0	0	1
4	Abdasa	20	10	1	1	0	1
5	Anjar	6	6	2	1	0	1
6	Bhachau	0	0	0	0	0	1
7	Bhuj Village	5	10	1	0	0	2
8	Lakhpat	1	1	0	1	0	1
9	Mandvi	0	1	0	0	0	1
10	Mundra	0	0	0	0	0	1
11	Nakhatrana	2	2	1	0	0	0
12	Rapar	10	2	1	1	0	1
	Total	113	87	17	7	24	12

List of Boats available with Fishery Department of Kutch District

Sr. No.	Taluka	Name of Boat	Name of Owner	Location	Contact Number	Remark
1	Bhuj	Fiber	Collector office	Fishery	02832 250292	Not In Working

Gujarat State Road Transportation Nigam Limited Number of Bus

SR NO	TALUKA	OFFICE	NUMBER OF BUS
1	BHUJ	02832-220002	79
2	MANDVI	02834-223004	60

3	MUNDRA	02838-224200	40
4	ANJAR	02836-242692	44
5	BHACHAU	02837-224049	32
6	RAPAR	02830-220002	33
7	NALIYA	02831-222119	38
8	NAKHATRANA	02835-222129	46

Contact Detail of Community Health Center and Hospital

Sr.	Block	Name of CHC	Landline No.		Medical Officer	
			STD Code	Landline	Mobile	Name of suprimtendent
1	**Anjar**	Dudhai	--	--	94274346741	DR.G.J.Maheta
2	**Mandvi**	Gadhasisa			99983510 98	Dr Madan Prasad
3	**Mundra**	Mundra	02838	222144	7567876192	Dr S.K. Damani
4		Bhujpur				Dr.Ketan Solanki
5	**Bhachau**	Bhachavu	02837	224034	9427234231	Dr.K.k. Kurmi
6		Lakadia		273307	7567876191	Dr. Sujeet kumar.
7		Janan			7567876270	Dr.K.A. Jaru
8	**Rapar**	Rapar	02830	220080	7096406209	Dr.Prakash Kariya
9		palasva	02806	262300	9712637884 7567876276	Dr. V.K.das
10	**Bhuj**	Khavda	02803	288229	7567876190	Dr.Rajesh Varma
11						
12		Dhori			9825428831	Dr.Nupurkumari M. Prasad
13		Bharapar			7567876187	Dr.Anila Goswami
14	**Abdasa**	Naliya	02831	222127	7567876194	Dr D.D.Dhulera
15	**Lakhpat**	Dayapar	02839	233326	9727450750	Dr.Lodhra
16	**Nakhatrana**	Nakhatrana	02835	222304	9727734010	Dr.T.G Panday

List of Participants inSpecial Flood Rescue training of Kutch District

Sr. No	Name	Mobile No.	Designation
1	Bhangi sanjay	9586650895	Public Volunteers
2	Bhatti Jay	--	Helper
3	Buchiya Mahesh	--	Helper
4	Charan valji	9909728581	Public Volunteers
5	Chauhan K. Dilipbhai	9711417961	Fireman
6	Chauhan Kalpeshkumar Dilip	9725337803	Public Volunteers
7	Chauhan Vijaysingh Ranjitsingh	9328043401	Public Volunteers
8	Damor raman	9099189395	Public Volunteers
9	Dodiya kanji	9979915779	Public Volunteers
10	Gadhavi kishorbhai	9979051950	Public Volunteers
11	Gohil pratap	9274246214	Public Volunteers
12	Joshi Jitesh Kishorchandra	9879028330	Public Volunteers
13	Joshi Jiteshbhai	9879028330	Fireman
14	Kanojiya Sandip Kishorbhai	9016727074	Public Volunteers
15	Kumar Praveen Harpalsingh	9712347363	Public Volunteers
16	Locha Narendra N	--	Helper
17	Maheshwary Prajesh M.	9924499720	Public Volunteers
18	Maheta Bharatbhai	9727326096	Public Volunteers
19	Makani madhusudan	9427167405	Public Volunteers
20	Makani navian	9974767641	Public Volunteers
21	Makvana Sunilbhai	9979252664	Fireman
22	Makwana Pratik Dilipbhai	9687626984	Public Volunteers
23	Maru Anilbhai	9978246682	Fire officer
24	Meriya jemalbhai	9099062594	Public Volunteers
25	Mkani bhavesh	9974999254	Public Volunteers
26	Mori Dharmesh Raisinhbhai	9376715907	Public Volunteers
27	Parmar Jigneshkumar Amrutlal	9429006841	Public Volunteers
28	Parmar Punit Dipakbhai	9428818627	Public Volunteers
29	Parmar Sachinbhai	99254 28576	Fireman
30	Patel Dhavalkumar Jayantilal	9726470015	Public Volunteers
31	Patel Hardikkumar Amrutlal	9033892445	Public Volunteers
32	Rajgor mahesh	9726680688	Public Volunteers

33	Rajgor Maheshkumar Shantilal	9726680688	Public Volunteers
34	Rathod manubhai		Public Volunteers

List of Swimmers of Kutch District

Sr. No.	Name of Taluka	Name of Swimmers	Address	Mobile No.
1	Mandvi	Jam Abhu Nurmama	Tragadi	9726680340
2	Mundra	Haji Jakum Manek	Bhradeswar	9586599910
3	Mundra	Mamad Ushman Majaliya	Bhradeswar	8141465566
4	Mundra	Taiyab Ali Vagher	Jarpara	9979796904
6	**Mundra**	**Sali Ibrahim Vagher**	**Jarpara**	**9427769037**

State Level Emergency Contacts Number

Sr. No.	EOCs/ Control rooms	Code	Contact Numbers
1	State Emergency Operation Center	079	23251900
			23251902
			23251914
			F- 23251916
2	Relief Commissioner	079	23251509
			23251568
3	Director of Relief	079	23251611
			23251916
			23251912
4.	CEO, GSDMA	079	23259220
			23259275
			23259289

5	Pri. Secretary Revenue Department	079	23251591 23251591
6	Dy. Collector (SEOC)	079	23251990 23251916-12
7	India Meteorological Department ,Ahmadabad	079	22865012 22865449 22865165 22861413
8	Institute of seismological Gandhinagar	079	66739000 23257641 23252703
9	NDRF team Gandhinagar	079	23201551 F- 23202540
10	Commandant of NDRF team Gandhinagar	079	23202540 094288 26445
11	District EOC Help line	02832	1077
12	States EOC Help line		1070

Cyclone Signal

PORT STORM WARNING SIGNAL NO.	DAY SIGNAL	NIGHT SIGNAL	MEANING
1			*DISTANT CAUTIONARY (There is a region of squally weather in whicha storm may be forming.)*
2			DISTANT WARNING *(A storm has formed.)*
3			LOCAL CAUTIONARY *(The port is threatened by squally weather.)*
4			LOCAL WARNING (*The port is threatened by a storm but it does not appear that the danger is as yet sufficiently great to justify extreme measures of precaution.)*
5			DANGER (*The port will experience severe weather from a cycloneexpected to move keeping the port to the left of its track.)*
6			DANGER (*The port will experience severe weather from a cyclone expected to move keeping the port to the right of its track.)*
7			DANGER (*The port will experience severe weather from a cyclone expected to move over or close to the port.)*
8			GREAT DANGER (*The port will experience severe weather from a severe cyclone expected to move keeping the port to the left of itstrack.)*
9			GREAT DANGER (*The port will experience severe weather from a severe cyclone expected to move keeping the port to the right of itstrack.)*
10			GREAT DANGER (*The port will experience severe weather from a severe cyclone expected to move over or close to the port.)*
11			FAILURE OF COMMUNICATIONS *(Communications with the Meteorological Warning center have broken down and the local officerconsiders that there is danger of bad weather.)*

General Terminology Used in Weather Bulletins

Sr. No.	Rain in mm"(24 hrs)	Terminology
1	0.1.mm to 2.4 mm"	Very light rain
2	2.5 mm to 7.5 mm"	Light rain
3	7.6 mm to 34.9 mm"	Light to Moderate rain
4	35.0 mm to 64.9 mm"	Moderate rain
5	65.0 mm to 124.9mm"	Heavy rain
6	Exceeding 125 mm"	Very Heavy rain

Sr. No.	Percentage Area Covered	Terminology Used
1	1 to 25	Isolated
2	26 to 50	Few Places
3	51 to 75	Many Places
4	76 to 100	At most Places

Evacuation

Sr. No.	Signal	Activity
1	White Signal	Alert condition
2	Blue Signal	Ready for Evacuation
3	Red Signal	Immediate Evacuation

Cyclone

A cyclone is a storm accompanied by high-speed whistling and howling winds. It brings torrential rains.

Where does a cyclone come from?

A cyclonic storm develops over tropical oceans like the Indian Ocean and Bay of Bengal and theArabian Sea. Its strong winds blow at great speed, which can be more than 118 kilometers per hour.

What are the visible signs of a cyclone?

When a cyclonic storm approaches, the skies begin to darken accompanied by lightning and thunder and acontinuous downpour of rain.

How does a cyclone affect us?

A cyclone causes heavy floods.

- It uproots electricity supply and telecommunication lines. Power supply shuts down and telephones stop functioning.
- Road and rail movements come to halt because floods damage rail tracks and breach roads. Rail movements are also disrupted because of communication failure.
- The inclement weather conditions also disrupt Air services. Seaports stop work due to high winds, heavy rains and poor visibility.
- Sometimes ships overturn or are washed ashore. The high speed winds bends and plucks out trees and plants.A cyclone tears away wall sidings and blows off roofs of houses.
- Houses collapse and people are rendered homeless. In villages kacha houses get blown away. Thespeeding winds cause loose metal and wooden sheets to fly turning them to potential killers. Broken glass pieces can cause serious injuries.
- The floodwaters can take time to recede.
- The floodwaters can turn the fields salty.
- Bridges, dams and embankments suffer serious damages.
- Floods wash away human beings and animals and make water unfit for drinking. There can be outbreak of diseases like Cholera, Jaundice or Viral fever due to intake of impure water. Water gets contaminated because of floating corpses of animals and human beings and mixing of sewage stored food supplies, gets damaged.

Which areas are exposed to a cyclone in Gujarat?

In Gujarat, the Saurashtra-Kachchh region experiences a cyclone. The port towns of Veraval, Porbandar, Jamnagar, Dwarka, Okha, Kandla and Bhavnagar and other minor port towns suffer most.

Does a cyclone follow a particular path?

It is often difficult to predict where a cyclone will strike. When it starts moving from oceans (in Gujarat it is Arabian Sea) towards the land area, a cyclone can change track and hit areas other than those anticipated earlier.

Has any early warning system been evolved for the occurrence of a cyclone?

Yes. In India, the Indian Meteorological Department has developed a four-stage warning system for a

cyclone.

How does the system operate?

- This warning is about the possibility of a cyclone when a low pressure depression develops in oceans. For Gujarat, the development of such a depression in the Arabian Sea is indicative of a cyclone attack.

The Alert stage

- This warning is given 48 hours prior to the time when a cyclone is expected to hit the land.

The Warning stage

- This is the stage when a cyclone gets formed. The warning is given 24 hours before the anticipated time of arrival of a cyclone.

Cyclone arrival

- This warning is issued 12 hours before a cyclone is due to hit the land. The warning gives information about cyclone and will continue until the winds subside. In sea ports, danger signal are hoisted about the impending cyclone.
- From where can people access cyclone storm warnings?
- Warnings about storms, their intensity and the likely path they may take are regularly broadcasted by radio and television network continuously until the storm passes over.

What to do before and during a cyclone.

Have your dwellings checked before a cyclone season starts and carry out whatever repairs that are needed.

- Talk to children and explain about cyclones without scaring them.
- Create storm awareness by discussing effects of a cyclonic storm with family members so that everyone knows what one can and should do in anemergency. This helps to remove fear and anxiety and prepares everyone to respond to emergencies quickly.
- Keep your valuables and documents in containers, which cannot be damaged by water.
- Keep information about your blood group.
- Keep lanterns filled with kerosene, torches and spare batteries. These must be kept in secureplaces and handy.
- Make plans for people who are either sick, suffer from disabilities, aged and children.
- Store up at least seven-day stock of essential food articles, medicines and water supply.

- Keep blankets and clothes ready for making beds. Also keep cotton bandages and several copies of photographs of family members in case they areneeded for identification purposes after the storm.
- Store some wooden boards so that they can be used to cover windows.
- Keep trees and shrubs trimmed. Remove damaged and decayed parts of trees to make them resist wind and reduce the potential for damage. Cut weakbranches and make winds blow through.
- All doors, windows and openings should be secured.
- Continue to listen to warning bulletins and keep in touch with local officials. Keep radio sets inworking condition. Battery powered radio sets are desirable.
- Evacuate people to places of safety when advised.
- Take steps to protect your assets.
- Store extra drinking water in covered vessels.
- Remain calm.

What should one not do during a Cyclone attack?

- During the storm do not venture out unless advised to evacuate.
- If you have a vehicle and wish to move out of your house, leave early before the onset of acyclone. It is often best to stay at home
- Avoid remaining on the top floor of dwellings. Stay close to the ground.

Earthquake safety

- Tell the facts about earthquake to your family members
- Construct new buildings with earthquake resistant method and strengthen the old buildings
- Insure your house and family members
- Take the training for first aid and fire fighting
- Do not keep cots near the glass window
- Do not keep heavy and fragile things in the selves
- Do don’t hang photo frames, mirrors, or glasses up your bed
- Keep your important documents, some cash and necessary articles ready in a bag
- Get your house insured before the earthquake
- Identify special skills of neighbor (medical, technical) so that it can be utilized in emergency

During Earthquake

- Do not panic
- If already inside, than Stay indoors! Get under a heavy desk or table and hang on to it.
- If fire breaks out, drop on the floor and crawl towards the exist
- If you are out doors during the quake, keep away from buildings, trees and electricity lines. Walk towards open places, in a calm and composedmanner.
- If you are driving, quickly but carefully move your car as far out of traffic as possible and stop. Do not stop on or under a bridge or overpass or undertrees, light posts, power lines, or signs. Stay inside the car until shaking stops
- If you are in a school, get under a desk or table and hold on

Flood Safety

Do's and Don'ts after flood

- There is a possibility of spread of water borne diseases after flood, and hence
- Medical treatment should be taken immediately.
- Do not enter deep, unknown waters.
- Do not go near the riverbank even after the floodwater has receded.
- Sprinkle medicines in the stagnant dirty water.
- Inspect your house for any cracks or other damage. Check all the walls, floor,ceiling, doors and windows, so that any chance of house falling down canbeknown and you can be aware about the immediate danger.
- If the floodwater has entered the house or has surrounded the house, then it isadvisable not to enter such house.
- Keep listening to weather forecast on radio and television. Move to your residenceonly when instructed by the competent authority. It is not safe to believe that theproblems have ended after the flood water have receded
- Inform the competent authority/officer for restoration of the necessary connectionslike gas, electricity, telephone, drainage, etc.
- Beware of the various insects or poisonous snakes that may have been draggedinside the house along with the floodwater.
- Destroy the food commodities that have been affected by floodwater.
- Check properly all the electric circuits, floor level furnace, boilers, gas cylinders, orelectric equipments like motor pump etc. Check whether anyinflammable orexplosive item has not entered along with the floodwater.
- Switch off the main electric supply, if any damage is noticed to the electricequipments.
- If you find any breakage in the drainage system stop using latrines and do not usetap water.
- Do not use polluted water.
- Sewerage system should be checked and any damage should be repairedimmediately so as tocurtail spread of diseases.
- Empty the water clogged in the basement slowly with help of water pump so thatdamage toinfrastructure can be minimized
- Check gas leakage which can be known by smell of gas or by hearing the sound ofleakage;immediately open all windows and leave the house.
- Boil drinking water before usage and drink chlorinated water.
- Eat safe food.
- Rescue work should be undertaken immediately after flood situation as per theinstruction. Do notfollow any shortcut for rescue work.

- Do not try to leave the safe shelter to go back home until the local officials declarenormalcy afterflood and instruction to return home are not given.

Tsunami:

The phenomenon Tsunami is a series of traveling ocean waves of extremely long length generated primarily by earthquakes occurring below or near the ocean floor:

Following safety measures needs to be learnt before, during and after the occurrence of tsunami: Before

- Be familiar with the tsunami warning signals. People living along the coast should consider an earthquake or a sizable ground rumbling as a warning signal. A noticeable rapid rise or fall in coastal waters is also a sign that a tsunami is approaching.
- Make sure all family members know how to respond to a tsunami. Make evacuation plans. Pickan inland location that is elevated.

- After an earthquake or other natural disaster, roads in and out of the vicinity may be blocked, so pick more than one evacuation route.
- Teach family members how and when to turn off gas, electricity, and water
- Children should be taught in advance about the evacuation plans
- Prepare emergency kit beforehand. The emergency kit should contain Flashlight and extrabatteries, battery-operated radio and extra batteries, First aid kit
- Emergency food and water, Essential medicines etc

During

- Listen to a radio or television to get the latest emergency information, and be ready to evacuate ifasked to do so.
- If you hear a tsunami warning, move at once to higher ground and stay there until localauthorities say it is safe to return home.
- Move in an orderly, calm and safe manner to the evacuation site
- Stay away from the beach. Never go down to the beach to watch a tsunami come in.
- If you can see the wave you are too close to escape it.
- Return home only after authorities advise it is safe to do so.

After

- Stay tuned to a battery-operated radio for the latest emergency information.
- Help injured or trapped persons.
- Stay out of damaged buildings. Return home only when authorities say it is safe.
- Enter your home with caution. Use a flashlight/torch when entering damaged buildings. Check for electrical shorts and live wires. Do not use appliances or lights until an electrician has checkedthe electrical system.
- Open windows and doors to help dry the building.
- Shovel mud while it is still moist to give walls and floors an opportunity to dry.
- Check food supplies and test drinking water.
- Fresh food that has come in contact with flood waters may be contaminated and should be thrown

CHAPTER-7
TRAINING REHEARSAL AND RECORDS

7.1 Need of Rehearsal & Training

Regular training and rehearsal program of emergency procedures shall be conducted with elaborate discussions and testing of action plan with mock drill. If necessary, the co-operation/guidance of outside agencies will be sought.

7.2 Some Check Points

a) The extent of realistic nature of incidents.
b) Adequate assessment of consequences of various incidents.
c) Availability of sufficient resources such as water, fire fighting aids, personnel.
d) The assessment of time scales.
e) Logical sequences of actions.
f) The involvement of key personnel in the preparation of plan.
g) At least 24 hour's covers to take account of absences due to sickness and holiday, minimum shift manning.
h) Satisfactory co-operation with local emergency services and district or regional emergency planning offices.
i) Adequacy of Site.

7.3 Records and Updating the Plan

All records of various on-site and off-site emergency plans of the factory will be useful alone with those of the factors by which statutory authorities draw a detailed plan for the whole area/district. The records of the activity will be updated regularly.

7.4 Emergency Instruction Booklet and Emergency Organogram

The duties of various personnel in an emergency are mentioned in **Annexure-33.**

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ANNEXURES

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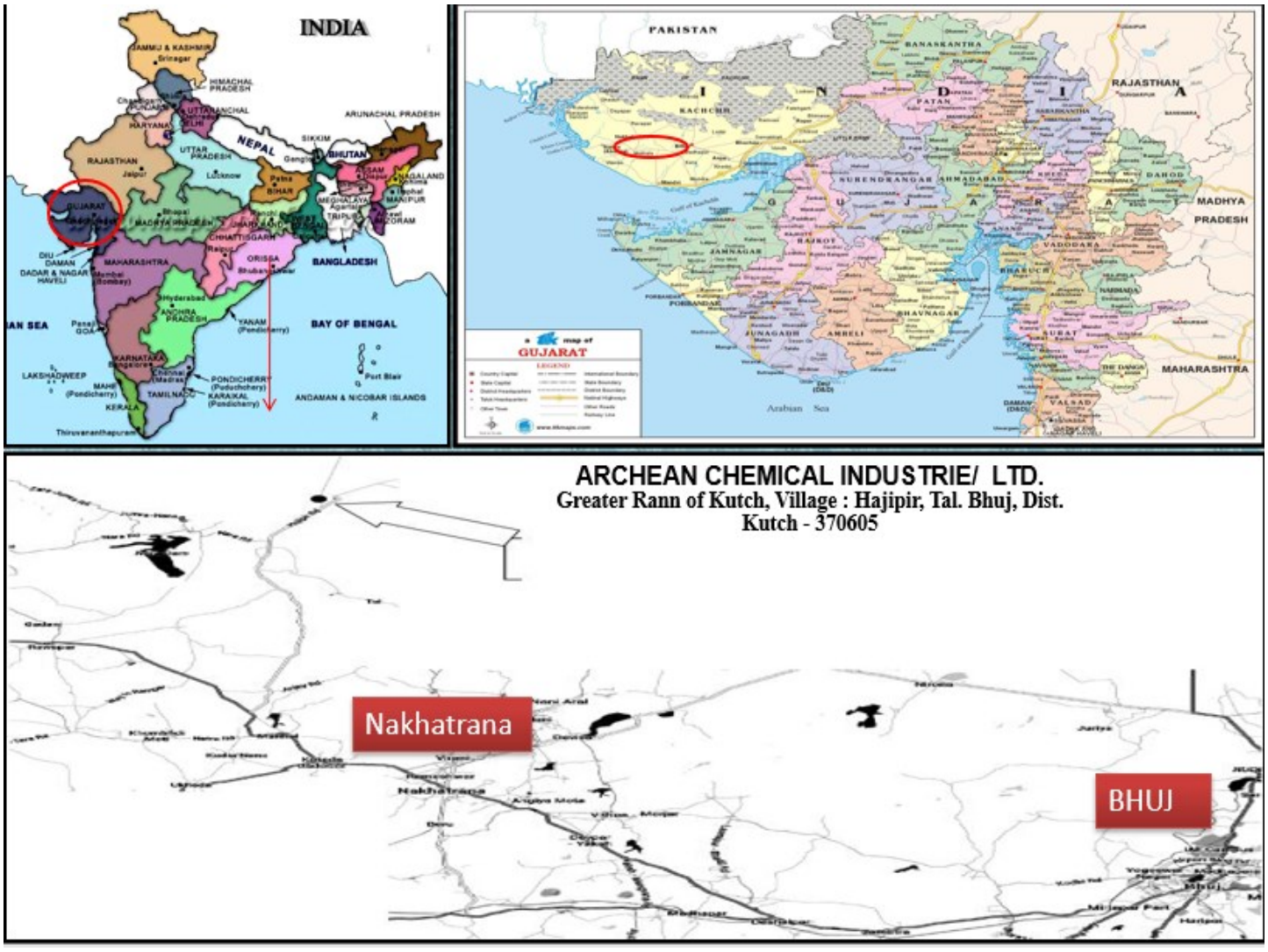
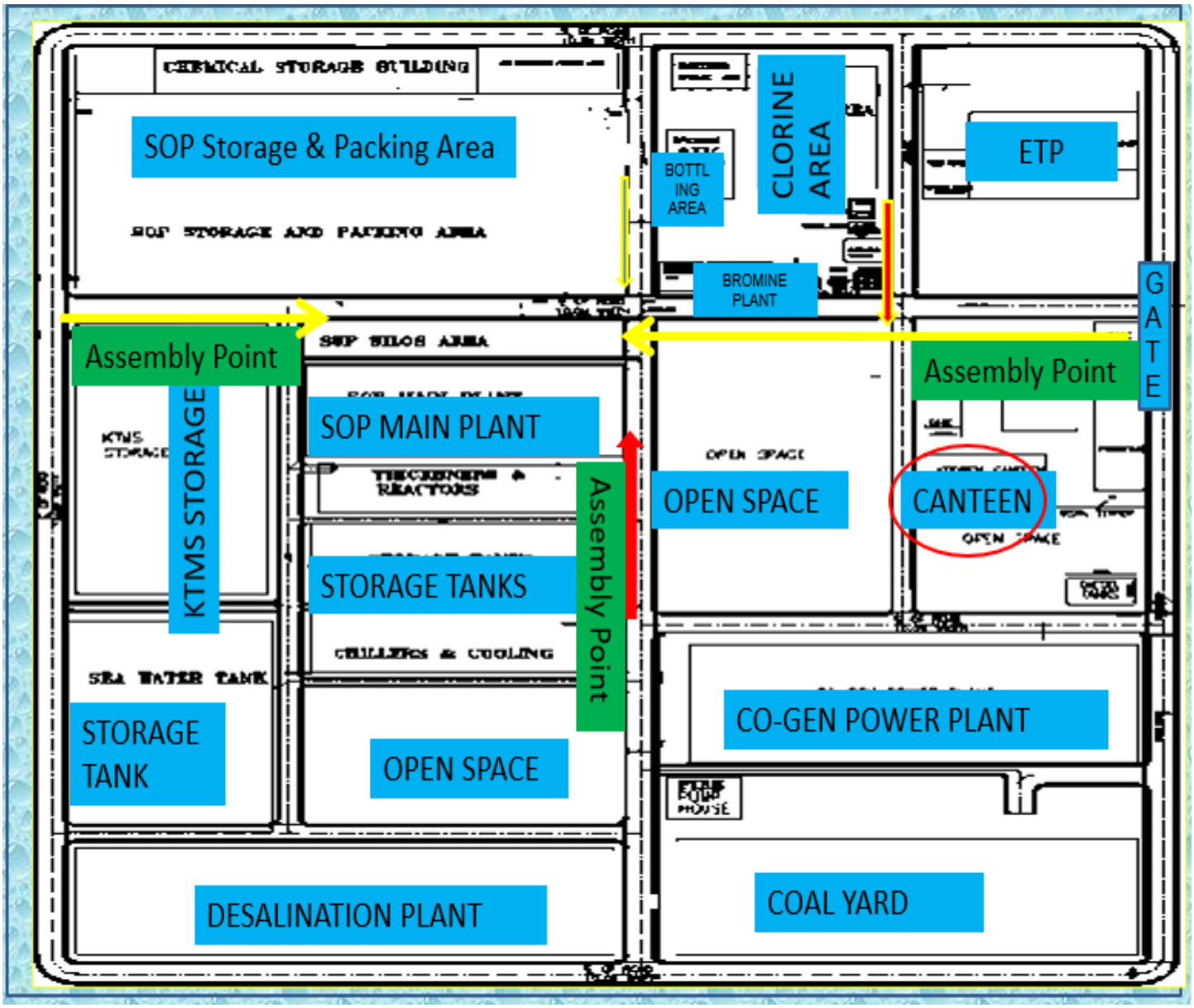
ANNEXURE – 2: MAP OF THE AREA



Archean Chemical Industries Limited

ANNEXURE – 3: FACTORY LAYOUT

Archean Chemical Industries Limited



ANNEXURE - 4: STORAGE HAZARDS & CONTROLS

A. Raw materials & Solvents:

Sr. No.	Name of Materials Stored	Quantity (Maximum)	Location of Storage	Operating Pr./Temp	Type of Hazard	Control provided
1.	BROMINE (IN TANKS)	30 MT	Bromine Plant	Atmospheric	Bromine Leakage Toxic gas./Toxic liquid	• Neutralizing media provided. • Arrangement made for respiratory protection. • Dyke provided. • Detection & Alarm system provided. • Scrubber Provided • Foam generator provided • Buffer tank Provided with discharge facility
2.	CHLORINE	400 MT	Cl2 Storage	Atmospheric	Chlorine Leakage Toxic gas.	• Neutralizing media provided • Arrangement made for Respiratory protection. • Detection & Alarm system provided • Emergency kit provided. • Scrubber Provided
3.	CAUSTIC	20 MT	Tank Farm	Atmospheric	Health hazards	• Keep in restricted area. • Kept at isolated area • SOP made for safe handling • PVC Air Pressure suit to be used while loose handling. • Dyke walls provided
4.	SULFURIC ACID	120 KL	Tank Farm	Atmospheric	Health hazards	• Keep in restricted area. • Kept at isolated area • SOP made for safe handling • PVC Air Pressure suit to be used while loose handling. • Dyke walls provided
5.	SO2 GAS	150 MT	SO2 Yard	Atmospheric	Health hazards	

ANNEXURE – 5: IDENTIFIED EMERGENCY CONDITIONS

Sr. No.	Work Activity	Hazards identified	Possible Causes	Existing Risk Control measures to prevent occurrence of Emergency a. Elimination b. Substitution c. Engineering/ Isolation d. Administrative e. PPE	Risk Rating (L/M/H)	Actions to be taken during Emergency
1	ECR panel	Fire	Due to load, Short circuit, Over heating, Shock to human	c1. Relay system to trip at Overload c2. Over heat protection c3. Smoke detector with alarm at ECC c4. Rubber mat/ Coating for protection of shock d1. SOP in place d2. Authorised person name display to operate and maintenance carried out d3. LOCK OUT – TAG OUT system in place d4. Work permit system in place d5. PM and break down maintenance system in place d6 Trained fire men and ERT available round the clock d7 Training system in place E1 12KV and 24KV hand gloves available	**M**	**General:** 1. First Observer to inform to security for raising Alert Siren 2. Security to Raise Alert Siren and wait for ECC for further instructions on raising Evacuation siren 3. Crowd Control team to consider for help in safe evacuation of non-essential employees, visitors and casuals 4. ERT team to reach at incident place with required Emergency aids 5. Wear cartridge mask, replace safety shoes by gum shoes if necessary, stay upwind and divide into teams of 3-4 persons in each team and wait for instruction from ERT leader who will be working in consultation of Incident controller. 6. Only specialized ERT members to reach near incident place for fire-fighting from front and extinguishing the fire using fire extinguisher and connect Fire hoses from nearest Hydrant points and connect through Foam trolleys 7. Other ERT members to stand little far for back-up support 8. Other teams to act as per their roles in the Emergency plan or as per instructions from ECC **Specific:** 1. Barricade the area. 2. Consider Taking control of movement of Emergency vehicle services like Ambulance/Fire Tenders 3. Consider Cut off of Power, off source, Switching off. 4. Understand reasons / source of fire and attempt extinguish from upwind directions staying 12 m away and then gradually moving forward. 5. Do not use water and foam to extinguish the fire only CO2 and Sand to be used and in adverse condition DCP till fire is extinguished

Sr. No.	Work Activity	Hazards identified	Possible Causes	Existing Risk Control measures to prevent occurrence of Emergency a. Elimination b. Substitution c. Engineering/ Isolation d. Administrative e. PPE	Risk Rating (L/M/H)	Actions to be taken during Emergency
						6. In case of Carbon dioxide extinguisher used, do not allow the persons to enter into the area till the time, the carbon dioxide is dispersed and diluted to avoid any suffocation 7. Step to be taken to evacuate non-essential person from incident place 8. Rescue team to consider work on rescuing trapped persons, if any 9. If necessary induce vomiting, give artificial respiration and the affected person should be sent to the nearest doctor/clinic 10. Do not permit any naked flame and smoking in the area 11. Consider pollution control monitoring and consider on-site Emergency declaration
2	Bromine transferring, loading/unloading, and handling	Toxic exposure, Chemical burns, Fire, Spillage, Environmental contamination	Leakage from transfer pipes, Improper handling, Equipment failure, Human error, Hose rupture, Overfilling, Tank failure	a. Elimination: Not applicable due to the nature of the process. b. Substitution Not possible. c. Engineering/Isolation: c1. Use of double-sealed transfer pumps. c2. Installation of emergency shut-off valves. c3. Continuous monitoring with Bromine leak detectors and alarms. c4. Spill containment bund around loading/unloading area. c5. Pressure-relief valves in transfer lines. d. Administrative: d1. SOP for Bromine handling. d2. Only trained and authorized personnel allowed for loading/unloading. d3. Work permit system in place for all loading/unloading activities. d4. Regular inspection and maintenance schedule.	**H**	1. General: 2. 1. First observer to alert security and ECC for raising alert siren. 3. 2. Security to initiate alert siren and coordinate with ECC for further actions like evacuation. 4. 3. ERT to reach incident site with necessary emergency aids, such as spill control kits, SCBA, and fire extinguishers. 5. 4. All personnel to wear SCBA, chemical-resistant suits, and other required PPE. 6. 5. Evacuate non-essential personnel from the area immediately and ensure they stay upwind. 7. 6. Prevent unauthorized entry by barricading the area. 8. 7. ECC to coordinate with the Incident Controller for communication and additional instructions. 9. Specific: 10. 1. Attempt to stop the leak using remote shut-off valves. 11. 2. Isolate the source of the spill by closing transfer valves and cutting off power to transfer pumps. 12. 3. Apply neutralizing agents (such as soda ash) to small spills, if safe to do so.

Sr. No.	Work Activity	Hazards identified	Possible Causes	Existing Risk Control measures to prevent occurrence of Emergency a. Elimination b. Substitution c. Engineering/ Isolation d. Administrative e. PPE	Risk Rating (L/M/H)	Actions to be taken during Emergency
				d5. Emergency response team (ERT) training in chemical spills and Bromine-specific incidents. d6. Regular drills for spill containment and evacuation procedures. d7. Display of hazard signs and emergency instructions in the area. e. PPE: E1. Full-body chemical-resistant suits. E2. Self-contained breathing apparatus (SCBA) for personnel involved in handling. E3. Chemical splash goggles and face shields. E4. Chemical-resistant gloves and boots.		13. 4. Use absorbent materials and spill containment barriers for larger spills to prevent spreading. 14. 5. Monitor air quality and ensure that the Bromine concentration is safe before allowing personnel back into the area. 15. 6. Rescue team to check for trapped or injured persons using SCBA and provide first aid as needed. 16. 7. Transport affected personnel to a medical facility after decontamination and follow up with an emergency medical team. 17. 8. Consider on-site emergency declaration if the spill is unmanageable or poses a high risk to personnel and the environment. 18. 9. Prevent use of any ignition sources in the vicinity and maintain a no-smoking zone. 19. 10. Notify local environmental and regulatory authorities if required, especially in case of environmental contamination.
						1.
3	Transfer of Bromine to Storage tanks from ISO tanker	Fatality due to toxicity - Higher concentrations	Spillage/ leakage due to mis-operation Spillage due to damage to pipe or gasket during transferring	c1. Pipe and Pipe fittings are of PVDF c2. Teflon Enveloped Acid-60 gasket c3. Remote operation of pump in case of emergency. c4. Containment with water filled in dyke areas c5. Secondary system connected with scrubber c6. Dykes with acid proof tile lining. c7. One tank always kept empty for inter transfer during Emergency.	**M**	**General:** 1. First Observer to inform to security for raising Alert Siren 2. Security to Raise Alert Siren and wait for ECC for further instructions on raising Evacuation siren 3. Crowd Control team to consider for help in safe evacuation of non-essential employees, visitors and casuals 4. ERT team to reach at incident place with required Emergency aids 5. Wear PVC Suits (4-5 persons), SCBA sets (2-3 persons), replace safety shoes by gum shoes if necessary, stay upwind and divide into teams of 3-4 persons in each team and wait for instruction from ERT leader who will be working in consultation of Incident controller.

Sr. No.	Work Activity	Hazards identified	Possible Causes	Existing Risk Control measures to prevent occurrence of Emergency a. Elimination b. Substitution c. Engineering/ Isolation d. Administrative e. PPE	Risk Rating (L/M/H)	Actions to be taken during Emergency
			Spillage from pump during transfer	c8. Load cell and level transmitter provided. c9. Pump is of type adequate for Bromine application. d1. Initial transfer under Nitrogen till pump section gets filled d2. SOP to transfer d3. Tanker unloading checklist d4. Unloading done under specific supervision. d5. Hose pipe connected from tanker with piping system is inspected for integrity d6. Emergency blower for use during Emergency. d7. Regular inspections through checklists for critical Storages e1. Trolley Mounted SCBA set for back up respiratory protection during emergency		6. 2 most competent persons to wear Air tight pressure suit with SCBA, if instructed so. 7. Only specialized ERT members to reach near incident place Try to close the necessary valves to stop the gas leakage 8. Curtain the gas emission and spread up by use of water or appropriate medium (Mayura Nozzle) water in the form of fog will reduce the concentration of acidic vapors in the surrounding 9. Other ERT members to stand little far for back-up support 10. Other teams to act as per their roles in the Emergency plan or as per instructions from ECC **Specific:** 1. Barricade the area. 2. Consider Taking control of movement of Emergency vehicle services like Ambulance/Fire Tenders 3. Consider Cut off of Power, continuity of utility, cooling of nearby tank, cutting off source of leakage, Switching off Nitrogen Valve. 4. Understand reasons / source of leakage and attempt control from upwind directions 5. Consider transfer of material to Emergency tank 6. Rescue team to consider work on rescuing trapped persons, if any 7. Give the first aid to the injured persons, 8. Bring the patient to the fresh air, give the victims oxygen for sufficient time and transport to external health care facility if required 9. Other teams to consider Contain spread of chemical through earth material/ Soda ash 10. Block storm water drainage connected with tank farm area and all contaminated Fire fought water to be transfer to ETP through mobile pump under intimation to ETP . 11. After transferring of contaminated fire fought water ensure drainage should be free from contamination Consider application of soda ash/ Sodium thiosulfate for neutralizing the leakage

Sr. No.	Work Activity	Hazards identified	Possible Causes	Existing Risk Control measures to prevent occurrence of Emergency **a. Elimination** **b. Substitution** **c. Engineering/ Isolation** **d. Administrative** **e. PPE**	Risk Rating (L/M/H)	Actions to be taken during Emergency
						12. Consider pollution control monitoring and consider off-site Emergency declaration 13. Consider application of dilute caustic solution
4	Chlorine Tonner (900 kg) Loading, Unloading, and Charging for Bromination and Mother Liquor Preparation Process	Chlorine Gas Leak/Release, Exposure to Chlorine Gas	a. Improper handling during loading/unloading b. Tonner valve damage or malfunction c. Failure of connecting hose d. Corrosion or damage to tonner e. Inadequate venting during tonner changeover f. Overpressure in	**c. Engineering/Isolation** c1. Chlorine leak detection system with alarm at ECC c2. Emergency Shut-off Valve (ESV) installed c3. Chlorine absorption system (scrubber) in place c4. Proper hose and valve maintenance c5. Tonner handling crane with anti-swing and load limiters **d. Administrative** d1. SOP for loading, unloading, and charging d2. Trained personnel for chlorine handling d3. Lockout-Tagout (LOTO) system for tonner handling d4. Preventive Maintenance (PM) schedule for valves, hoses, and tonners d5. Regular leak test of connections d6. Authorized personnel list for tonner operations d7. Work permit system in place d8. Training program for Emergency Response Team (ERT) **e. PPE** e1. Full face mask with chlorine-specific cartridges e2. Chlorine-resistant gloves and	**M**	**General:** 1. First observer to inform security and ECC for raising Alert Siren 2. Security to raise Alert Siren and await further instructions from ECC for Evacuation Siren 3. Crowd Control team to assist in the safe evacuation of non-essential personnel 4. ERT team to reach the incident site with SCBA sets and chlorine emergency kit 5. Wear appropriate PPE, stay upwind, and divide into teams of 3-4 people for coordinated response 6. Specialized ERT members to identify the leak source and attempt to isolate the tonner from a safe distance using remote-operated valves if available 7. Other ERT members to stand by for back-up support 8. Other teams to act according to their roles in the Emergency plan or as per ECC instructions **Specific:** 1. Barricade the area to restrict access 2. Ensure safe passage and control for emergency vehicles like Ambulances 3. Close nearby valves and shut off the chlorine supply if possible 4. Use a neutralizing agent like caustic soda solution to neutralize minor leaks in a scrubber 5. Attempt to stop the leak by applying emergency chlorine tonner repair kits if trained and safe to do so 6. If a chlorine cloud is formed, instruct personnel to stay upwind and move to higher ground 7. Consider evacuation of non-essential personnel from downwind areas 8. Rescue team to work on evacuating trapped individuals if any

Sr. No.	Work Activity	Hazards identified	Possible Causes	Existing Risk Control measures to prevent occurrence of Emergency a. Elimination b. Substitution c. Engineering/ Isolation d. Administrative e. PPE	Risk Rating (L/M/H)	Actions to be taken during Emergency
			the system	aprons e3. SCBA sets for emergency use		9. If any personnel are exposed, remove to fresh air, administer oxygen if needed, and transfer to medical facility 10. Conduct continuous air monitoring and declare an on-site emergency if chlorine concentration exceeds safety limits 11. Report the incident to the relevant authorities as per SOP and maintain a record of the incident
5	Caustic Loading/Unloading	Chemical burns, Spills, Leaks	Hose failure, human error, overfilling, hose disconnection, equipment malfunction	c1. Use of closed transfer system with coupling to avoid splashes c2. Spill containment trays around loading/unloading area c3. Emergency shower and eye wash station near the unloading point d1. SOP for safe loading/unloading procedure d2. Permit to work (PTW) system in place for the activity d3. Trained personnel only allowed to perform the task d4. Regular inspection of hoses and transfer lines e1. Use of full-body chemical-resistant suits, face shields, and gloves	**M**	General: 1. First Observer to inform security for raising Alert Siren 2. Security to raise Alert Siren and wait for instructions from ECC 3. Crowd Control team to ensure safe evacuation of non-essential personnel, visitors, and casuals 4. ERT team to arrive at the incident place with necessary emergency aids Specific: 1. Barricade the area to prevent unauthorized access 2. Stop the loading/unloading operation and cut off the flow of caustic 3. Use neutralizing agents (if applicable) to contain the spill 4. Wear full chemical-resistant PPE and approach the spill from upwind direction 5. Ensure proper ventilation and monitor for gas build-up 6. Use dry absorbents for smaller spills; consider using spill kits designed for caustic materials 7. Flush exposed skin and eyes with plenty of water for at least 15 minutes using the emergency shower/eye wash station 8. Arrange medical assistance if exposure has occurred 9. Dispose of contaminated materials as per hazardous waste disposal guidelines 10. Document the incident and follow up with an investigation to determine the root cause.

Sr. No.	Work Activity	Hazards identified	Possible Causes	Existing Risk Control measures to prevent occurrence of Emergency a. Elimination b. Substitution c. Engineering/ Isolation d. Administrative e. PPE	Risk Rating (L/M/H)	Actions to be taken during Emergency
6	Caustic Solution Preparation	Chemical burns, Vapors release	Incorrect concentration mixing, equipment failure, over-pressurization	c1. Use of automated dosing system to maintain proper concentration c2. Adequate ventilation system to prevent accumulation of vapors c3. Secondary containment for preparation area d1. SOP for caustic solution preparation d2. Permit to work system in place for solution preparation d3. Labeling and segregation of chemicals to avoid mixing errors e1. Use of chemical-resistant aprons, face shields, and gloves during preparation	M	**General:** 1. First Observer to inform security for raising Alert Siren 2. Security to raise Alert Siren and wait for further instructions from ECC 3. ERT team to reach the incident site with required emergency aids 4. Crowd Control team to assist in the evacuation of non-essential personnel **Specific:** 1. Stop the preparation process and isolate the area 2. Approach the spill or leak from the upwind direction 3. Use appropriate neutralizing agents for caustic spills (e.g., diluted acid) 4. Wear suitable PPE and ensure no skin exposure 5. Monitor the air for any vapor concentration using portable gas detectors 6. Use dry materials to absorb small spills and contain larger spills using spill containment barriers 7. Provide medical assistance for any affected individuals 8. Ventilate the area to disperse vapors and monitor the atmosphere for safe re-entry 9. Contact external emergency services if the situation escalates 10. Conduct a post-incident review to identify and implement preventive measures.
7	Sulfuric Acid Loading/Unloading	Acid Spillage, Burns, Toxic Vapors	Hose failure, Human error, Overfilling, Leaks	c1. Acid-resistant hoses and fittings c2. Spill containment system at loading/unloading area c3. Safety shower and eyewash station nearby c4. Use of acid-resistant coating on surfaces d1. SOP for loading/unloading operations d2. Training on handling hazardous chemicals d3. Work permit system for acid transfer	M	**General:** 1. First Observer to inform security for raising Alert Siren 2. Security to raise Alert Siren and await instructions from ECC 3. Evacuate non-essential personnel, visitors, and casuals 4. ERT team to reach the incident site with required emergency aids 5. Wear appropriate PPE, including cartridge masks and acid-resistant suits 6. Approach the spill from upwind direction and avoid contact with acid 7. Use spill containment kits (neutralizing agents) to contain and control the spill **Specific:** 1. Barricade the area and restrict access 2. Ensure ventilation in the area to disperse vapors

Sr. No.	Work Activity	Hazards identified	Possible Causes	Existing Risk Control measures to prevent occurrence of Emergency a. Elimination b. Substitution c. Engineering/ Isolation d. Administrative e. PPE	Risk Rating (L/M/H)	Actions to be taken during Emergency
				d4. Routine inspection of hoses, valves, and fittings d5. Emergency Response Team (ERT) available e1. Use of acid-resistant gloves, aprons, face shields, and respiratory protection		3. Consider the need for onsite emergency declaration based on spill size 4. Neutralize the spill with lime or soda ash if safe to do so 5. Ensure no ignition sources are present in the vicinity 6. Monitor pH levels of runoff water if the spill reaches drains 7. If skin contact occurs, flush affected area with water for at least 15 minutes and seek medical help 8. Coordinate with external emergency services if required
8	Bittern Acidification	Release of Toxic Fumes (Chlorine), Acid Burns, Spillage	Improper mixing of acid, Overdosage, Equipment failure	c1. Automatic dosing system to control acid addition c2. Ventilation system to control fumes c3. Use of scrubber system to neutralize any released gases c4. Bund walls around acidification area to contain spills d1. SOP for acid dosing and mixing d2. Training for operators on handling acids d3. Regular maintenance and inspection of dosing equipment d4. Leak detection system and alarms d5. ERT trained in handling toxic gas release e1. Acid-resistant PPE, full-face masks with chlorine cartridges, SCBA sets	**M**	**General:** 1. Inform security for raising Alert Siren 2. Security to raise Alert Siren and wait for ECC instructions 3. Evacuate non-essential personnel and visitors 4. ERT team to approach the incident site with appropriate PPE 5. Use SCBA if toxic gas concentration is high 6. Approach the spill from upwind direction **Specific:** 1. Barricade the area and restrict access 2. Switch off dosing pumps to prevent further acid addition 3. If fumes are present, use water spray to knock down vapors, ensuring not to add too much water to prevent overflow 4. Neutralize spill using soda ash or lime if safe 5. Ventilate area to disperse fumes 6. Monitor the concentration of toxic gases (Chlorine) using portable gas detectors 7. Rescue any trapped personnel following confined space entry protocols 8. Arrange for medical assistance if exposure to fumes occurs 9. Consider declaring an on-site emergency if the situation escalates beyond control.

Sr. No.	Work Activity	Hazards identified	Possible Causes	Existing Risk Control measures to prevent occurrence of Emergency a. Elimination b. Substitution c. Engineering/ Isolation d. Administrative e. PPE	Risk Rating (L/M/H)	Actions to be taken during Emergency
9	SO_2 Gas Tonner Handling and Charging	SO_2 Gas Leak	a. Valve malfunction b. Hose failure c. Improper connection d. Overpressure e. Damage during handling	c1. Engineering/Isolation: c1.1. Gas detectors installed at key locations c1.2. Automatic shut-off valves at critical points c1.3. Double-walled piping to prevent leaks c1.4. Pressure relief valve in place c1.5. Ventilation system in the charging area c2. Substitution: Use of safer gas containers if available d. Administrative: d1. SOP for gas handling and charging d2. Permit-to-work system for all gas-handling operations d3. Display of emergency contacts and procedures d4. Regular inspection and maintenance schedule d5. Training for operators on safe handling practices d6. Authorized personnel only for tonner handling e. PPE: e1. Full-face gas masks with SO_2 cartridges e2. Acid-resistant gloves and clothing e3. SCBA sets available at nearby locations	**M**	General: 1. First observer to alert ECC (Emergency Control Center) and nearby personnel. 2. ECC to raise alert siren and guide further actions, including considering evacuation if necessary. 3. Security to control entry points and restrict access to the incident area. 4. ERT team to proceed to the location with SCBA sets, emergency gas masks, and appropriate PPE. 5. Stay upwind of the gas leak and approach from the upwind direction. 6. ERT members to follow instructions from the Incident Controller. Specific: 1. Identify the source of the leak and attempt to stop it by closing the valve, if safe to do so. 2. Barricade the affected area and restrict entry. 3. Shut down the tonner charging operation and isolate the gas line using the automatic shut-off valves. 4. Ensure that all non-essential personnel are evacuated to a safe distance. 5. Consider contacting emergency services if the leak cannot be contained internally. 6. If gas detectors signal high concentrations, use SCBA while attempting containment. 7. Ensure ventilation in the area to prevent gas accumulation. 8. Provide first aid to any affected personnel, including moving them to fresh air and seeking medical attention. 9. Avoid using water directly on the leak, as it may create sulfurous acid. 10. Consider declaring an on-site emergency if the leak is beyond control and requires external support. 11. Conduct a post-emergency review to assess the incident and update procedures if needed.
10	Flood	Severe Electrocution hazards	Due to entering of water into MCC	C1. Strom water drainage provided C2. Power isolation from MCC/ Transformer yard C3. Robust RCC foundation of building	**M**	1. Floods normally come with early warnings 2. Be Vigilant and plan activities accordingly 3. Put off all sources of electricity and material supplies. 4. Raise Water reactive chemicals to elevated sections

Sr. No.	Work Activity	Hazards identified	Possible Causes	Existing Risk Control measures to prevent occurrence of Emergency a. Elimination b. Substitution c. Engineering/ Isolation d. Administrative e. PPE	Risk Rating (L/M/H)	Actions to be taken during Emergency
		Fatality due to collapse of building	and foundation of building			5. Do not allow hazardous chemicals to get mixed with flood water 6. If required call outside agencies like DPMC for help 7. Move people away to safe area 8. Do not permit unauthorized personnel into the affected areas 9. Carried out Head count of all working personnel available in premises 10. Preserve documents/ software/ other valuables of the Company. 11. Prepare and Use floaters for handling Emergency.
11	Earthquake	Collapse of building/ Fire and explosion Hazards leading to fatality or severe property damage	Due to inadequate design	C1. Robust RCC foundation of building C2. All the metal structure design as per earthquake (seismic zone)	**M**	1. Remember earthquake may or may not occur with early warnings. 2.Please put you plants under safe shut down and come down 3. Put off all sources of electricity and material supplies. 4.Please note that post Earthquake other Emergencies may occur 5.Stay away from buildings 6.Stay near to Assembly areas 7.Wait for communications from ECC 8.Be Vigilant and plan activities accordingly 9.Call outside agencies like DPMC for help 10.Do not permit unauthorized personnel into the affected areas 11Maintain Head count 12. Preserve documents/ software/ other valuables of the Company. 13. Prepare and Use Hydras and other earth moving equipment for handling Emergency.
12	Transportation of chemicals (out-	Fatality / chemical exposure to one or more person	Accident during transportation	c1. Containers fit for transportation of chemicals are used. d1. Approved transporters are utilized for the services of transportation.	**H**	1. On getting call, understand the type of chemical carried by vehicle which has met with the accident. 2. Understand the area where the accident has occurred 3. Provide information to nearby Police Station/ District administration to be able to take control of the situation and provide necessary warnings to nearby public 4. Mobilize Emergency Response team.

Sr. No.	Work Activity	Hazards identified	Possible Causes	Existing Risk Control measures to prevent occurrence of Emergency a. Elimination b. Substitution c. Engineering/ Isolation d. Administrative e. PPE	Risk Rating (L/M/H)	Actions to be taken during Emergency
	bound)			d2. Condition of vehicle is checked before filling of chemicals d3. Checks for drivers with appropriate license d4. Distribution of TREM card to driver d5. Necessary fill criteria of <20% or > 80 % is ensured		5. Identify other key personnel required for mitigating with the Emergency scenario 6. Mobilize transportation facility for the Emergency Response Team. 7. Collect necessary Emergency mitigation appliances and decide upon initial plan for mitigating the Emergency scenario. 8. Estimate approximate time to reach to the incident site and float communications to nearby Police Station/ District administration for further actions. 9. Provide other information as felt necessary by nearby Police Station/ District administration 10. Seek help for arrangement of any earth moving equipment/ crane etc 11. Move to the incident place with required Emergency handling gadgets 12. Tackle the Emergency according to the hazards 13. Consider traffic control 14. Consider shifting of people likely to be affected to safe area 15. Consider medical checks and rehabilitation of affected persons. 16. Clean up the affected area
14	Transportation of chemicals (in-bound)	Fatality/ chemical exposure to one or more person	Accident during transportation	c1. Containers fit for transportation of chemicals are used. d1. Approved transporters are utilized for the services of transportation. d2. Condition of vehicle is checked before filling of chemicals d3. Checks for drivers with appropriate license d4. Distribution of TREM card to driver d5. Necessary fill criteria of <20% or > 80 % is ensured	**H**	1. On getting call, understand the type of chemical carried by vehicle which has met with the accident. 2. Simultaneously, provide information to company from where the chemical was being procured 3. Understand the area where the accident has occurred 4. Seek help from manufacturer for further actions for following: a. Provide information to nearby Police Station/ District administration to be able to take control of the situation and provide necessary warnings to nearby public b. Collect necessary Emergency mitigation appliances and decide upon initial plan for mitigating the Emergency scenario.

Sr. No.	Work Activity	Hazards identified	Possible Causes	Existing Risk Control measures to prevent occurrence of Emergency a. Elimination b. Substitution c. Engineering/ Isolation d. Administrative e. PPE	Risk Rating (L/M/H)	Actions to be taken during Emergency
						c. Estimate approximate time to reach to the incident site and float communications to nearby Police Station/ District administration for further actions. d. Provide other information as felt necessary by nearby Police Station/ District administration e. Seek help for arrangement of any earth moving equipment/ crane etc f. Tackle the Emergency according to the hazards g. Consider traffic control h. Consider shifting of people likely to be affected to safe area i. Consider medical checks and rehabilitation of affected persons. j. Clean up the affected area 5. Mobilize Emergency Response team. 6. Identify other key personnel required for mitigating with the Emergency scenario 7. Mobilize transportation facility for the Emergency Response Team. 8. Move to the incident place with required Emergency handling gadgets and provide help to tackle Emergency according to the hazards.
15	Storm water management	Contamination spreading to outside premise in main storm channel of the estate	Improper implementation of controls	c1. Garland drains are provided prior to storm drains to avoid contamination going into drains. c2. Drain blocks provided in storm drain at various locations to prevent spread till main channel. c3. Collection pits and containment provided at various locations of material storage d1. Pre-monsoon checks of water in storm drains for pH and COD. d2. System of cleanup of storm drains prior to startup of monsoon d3. Fixed and mobile pumps available to be used in case of emergency.	**M**	1. Assess the reasons of spread of contamination and consider plugging of same. 2. Simultaneously ensure all barriers in storm drains are in place, if not provide the barriers/ blocks 3. If required consider containment through Earth material 4. Shift mobile pump and hose to convenient place from where maximum contaminants can be collected and transferred 5. Provide electrical connection to the pump and 6. Transfer the contaminated water to nearby sump and divert the collected water to ETP taking under notification to ETP. 7. Clean up the storm drain till COD and pH are in acceptable norms,

Sr. No.	Work Activity	Hazards identified	Possible Causes	Existing Risk Control measures to prevent occurrence of Emergency a. Elimination b. Substitution c. Engineering/ Isolation d. Administrative e. PPE	Risk Rating (L/M/H)	Actions to be taken during Emergency
16	Office Building office work	Fire hazards due to paper, wood cable	Short circuit, heat	Paper are kept in close system cupboard, Electrical cable in closed ceiling Relay system available at trip on over load, Smoke /Heat detector available Relay system to trip at Overload c2. Over heat protection c3. Smoke detector with alarm at ECC c4. Rubber mat/ Coating for protection of shock d1. SOP in place d2. Authorised person name display to operate and maintenance carried out d3. LOCK OUT – TAG OUT system in place d4. Work permit system in place d5. PM and break down maintenance system in place d6 Trained fire men and ERT available round the clock d7 Training system in place E1 12KV and 24KV hand gloves available		1.First Observer to inform to security for raising Alert Siren 2.Security to Raise Alert Siren and wait for ECC for further instructions on raising Evacuation siren 3.Crowd Control team to consider for help in safe evacuation of non-essential employees, visitors and casuals 4.ERT team to reach at incident place with required Emergency aids 5.Wear cartridge mask, replace safety shoes by gum shoes if necessary, stay upwind and divide into teams of 3-4 persons in each team and wait for instruction from ERT leader who will be working in consultation of Incident controller. 6.Only specialized ERT members to reach near incident place for fire-fighting from front and extinguishing the fire using fire extinguisher and connect Fire hoses from nearest Hydrant points and connect through Foam trolleys 7.Other ERT members to stand little far for back-up support 8.Other teams to act as per their roles in the Emergency plan or as per instructions from ECC Specific: 9. Barricade the area. 10.Consider Taking control of movement of Emergency vehicle services like Ambulance/Fire Tenders 11.Consider Cut off of Power, off source, Switching off. 12.Understand reasons / source of fire and attempt extinguish from upwind directions staying 12 m away and then gradually moving forward. 13.Do not use water and foam to extinguish the fire only CO2 and Sand to be used and in adverse condition DCP till fire is extinguished 14.In case of Carbon dioxide extinguisher used, do not allow the persons to enter into the area till the time, the carbon dioxide is dispersed and diluted to avoid any suffocation 15.Step to be taken to evacuate non-essential person from incident place 16.Rescue team to consider work on rescuing trapped persons, if any

Sr. No.	Work Activity	Hazards identified	Possible Causes	Existing Risk Control measures to prevent occurrence of Emergency a. Elimination b. Substitution c. Engineering/ Isolation d. Administrative e. PPE	Risk Rating (L/M/H)	Actions to be taken during Emergency
						17.If necessary induce vomiting, give artificial respiration and the affected person should be sent to the nearest doctor/clinic 18.Do not permit any naked flame and smoking in the area 19.Consider pollution control monitoring and consider on-site Emergency declaration

Hazard Assessment of Neighboring Industry

Note: Below mentioned hazard assessment carried out on the basis of dispersion modeling. Find here with details of hazard assessment.

Sr. No.	Work Activity	Hazards identified	Possible Causes	Risk Rating (L/M/H)	Actions to be taken during Emergency
1	Transfer of Bromine to Storage tanks from ISO tanker or from storage tank to day tank	Fatality due to toxicity - Higher concentrations IDLH Value 3 PPM, 1.1 KM	Spillage/ leakage due to mis-operation Spillage due to damage to pipe or gasket during transferring Spillage from pump during transfer	**H**	1. Emergency siren code(as per district authority instruction) 2. Wind sock for awareness of wind direction 3. Move in cross wind direction and follow the company emergency plan 4. Availability of gas cartridge mask for emergency use 5. Water curtaining through mayura in the pathway of toxic gases 6. Company owned transportation facility 7. Rehabilitation center across the wind direction with suitable facility
2	Chlorine Tonner Loading/Unloading and Charging	Toxic gas release leading to asphyxiation and potential fatalities (IDLH Value: 10 PPM)	a. Valve malfunction b. Hose failure c. Improper handling d. Overpressure e. Spillage during loading/unloading	**H**	1. 1. Activate the *emergency siren* and notify ECC (Emergency Control Center). 2. Utilize *wind direction indicators* (e.g., wind socks) to determine evacuation routes. 3. Evacuate personnel in a *crosswind direction* and follow the company emergency response plan. 4. Ensure the availability of *SCBA (Self-Contained Breathing Apparatus)* for emergency use. 5. Deploy *water spray curtains* to minimize gas dispersion. 6. Use *company-owned transportation* for evacuation if necessary. 7. Direct affected personnel to a *rehabilitation center* positioned away from the incident, ensuring it has appropriate medical support and shelter.

Summary of Fire & Explosion Modeling for Existing Facility

Consequence Impact Distances (m)							
S. No	**Scenarios**	**Release Size**	**Event**	**Impact Criteria**	**1.5 F weather**	**5.0 D weather**	**3 D weather**
1	Chlorine Tonner	Small Leak	IDLH	10 ppm	1876.57	323.08	414.76
		Catastrophic Rupture	IDLH	10 ppm	1876.5	323.08	414.76
2	Bromine Storage Tank (ST-703)	Small Leak	IDLH	3 ppm	449.75	128.26	144.83
		Catastrophic Rupture	IDLH	3 ppm	3156.95	1161.06	1113.02
				0.5 LFL	91.76	41.15	47.12
			Jet Fire	4 kW/m^2	65.57	56.07	58.77
				12.5 kW/m^2	50.76	41.77	44.77
				37.5 kW/m^2	41.49	32.92	35.97
			Late Pool Fire	4 kW/m^2	34.56	Not Reached	Not Reached
				12.5 kW/m^2	27.21	Not Reached	Not Reached
				37.5 kW/m^2	21.19	Not Reached	Not Reached
			Explosion	0.020 bar	336.55	150.69	172.18
				0.10 bar	149.65	66.78	71.98
				0.35 bar	115.05	51.24	53.43
			IDLH	-	Not Applicable	Not Applicable	Not Applicable
		Catastrophic Rupture	Flash Fire	LFL	73.53	83.88	77.61
				0.5 LFL	100.37	119.86	105.09
			Fire Ball	4 kW/m^2	273.13	238.9	239.09
				12.5 kW/m^2	155.44	137.81	137.91
				37.5 kW/m^2	86.27	76.44	76.49
			Late Pool Fire	4 kW/m^2	33.74	33.04	32.68
				12.5 kW/m^2	20.72	22.12	21.17
				37.5 kW/m^2	10.96	13.3	11.72
			Explosion	0.020 bar	613.4	647.32	643.44
				0.10 bar	217.17	212.85	213.54
				0.35 bar	149.21	144.01	141.29
			IDLH	-	Not Applicable	Not Applicable	Not Applicable

	Diesel Storage tank	Small Leak	Flash Fire	LFL	2.57	3.93	3.37
				0.5 LFL	2.83	4.32	3.86
			Jet Fire	4 kW/m^2	5.32	4.71	5.03
				12.5 kW/m^2	4.25	3.71	4
				37.5 kW/m^2	4.18	3.5	3.83
			Late Pool Fire	4 kW/m^2	24.2	25.23	24.27
				12.5 kW/m^2	14.58	17.13	15.79
				37.5 kW/m^2	6.43	7.27	6.7
			Explosion	0.020 bar	Not Reached	Not Reached	Not Reached
				0.10 bar	Not Reached	Not Reached	Not Reached
				0.35 bar	Not Reached	Not Reached	Not Reached
			IDLH	-			
		Catastrophic Rupture	Flash Fire	LFL	4.98	5.45	5.03
				0.5 LFL	4.98	5.45	5.03
			Jet Fire	4 kW/m^2	Not Applicable	Not Applicable	Not Applicable
				12.5 kW/m^2	Not Applicable	Not Applicable	Not Applicable
				37.5 kW/m^2	Not Applicable	Not Applicable	Not Applicable
			Late Pool Fire	4 kW/m^2	26.99	28.08	26.87
				12.5 kW/m^2	15.89	18.85	17.19
				37.5 kW/m^2	7.1	7.65	7.29
			Explosion	0.020 bar	Not Applicable	Not Applicable	Not Applicable

				0.10 bar	Not Applicable	Not Applicable	Not Applicable
				0.35 bar	Not Applicable	Not Applicable	Not Applicable
			IDLH	-	Not Applicable	Not Applicable	Not Applicable

ANNEXURE - 11: EVACUATION TABLE

EVACUATION TABLE BASED ON PREVAILING WIND VELOCITY OF 2 MTR./SEC

MATERIAL	RADIUS OF IMMEDIATE DANGER AREA [METERS]	DIMENSIONS OF EVACUATION	
		DOWNWIND [METERS]	CROSSWIND [METERS]
Bromine leakage from tank (@ 32.55 kg/sec)	13.36 m	2.6 km	1.3 km
Bromine leakage from tank (@ 6.51 kg/sec)	5.8 m	1.9 km	0.62 km
Leakage from Cl2 Tonner (@ 0.153 kg/s)	10 m	700 m	400 m

SITE MAIN CONTROLLER

SITE MAIN CONTROLLER			Next Person in case of absence of Site Main Controller		
Name	**Designation**	**Phone Number**	**Name**	**Designation**	**Phone Number**
MR. J S BEDI	SITE HEAD	9428252132	MR. RP SINGH	DGM	9499899073

Duties of Site Main Controller in case of Emergency:

- ❖ Overall Responsibility to control the incident.
- ❖ Co-ordinate ECC or if required, security for raising evacuation siren and all clear siren, in case emergency is over.
- ❖ In case, he feels necessary to be at Incident Place, he shall nominate some-one, responsible to be in ECC so that communications received in ECC can be suitably diverted to him/ addressed suitably.
- ❖ Declaration of major emergency ensures that outside emergency services are called and when required nearby firms and/ or mutual aid members are informed.
- ❖ Ensure that key personnel are called in.
- ❖ Exercise direct operational control on parts of the works outside the affected area.
- ❖ Maintain a speculative continuous review of possible development and assess these to determine most possible cause of events.
- ❖ Direct the shutting down and evacuation of plants in consultation with key personnel.
- ❖ Ensure causalities are receiving adequate attention; arrange for additional help if required. Ensure relatives are advised.
- ❖ Liaison with Chief Officers of the Fire and Police services providing advice on
- ❖ Ensure the accounting and head count of personnel.
- ❖ Control traffic movement within the work.
- ❖ Arrange for a chronological record of the emergency to be maintained.
- ❖ During prolonged emergency, arrange for the relief of the personnel and provision of catering facilities.
- ❖ Contact the local office to receive early notification of impending changes in weather conditions, in case of prolonged emergency.

- ❖ Issue authorized statements to the news media and informs R.O.
- ❖ Ensure that proper consideration is given to the preservation of evidence.
- ❖ Control rehabilitation of affected areas on cessation of the emergency

INCIDENT CONTROLLERS

INCIDENT CONTROLLER			Next Person in case of absence of Incident Controller		
Name	**Designation**	**Phone Number**	**Name**	**Designation**	**Phone Number**
MR. DAHYALAL	PLANT HEAD BROMINE	9408703335	MR. DHAWAL DAYATAR	MANAGER	9426896593
MR. GANPATHY	PLANT HEAD CO-GEN	9409305484	MR. RAJESH BALA	SR. ENGINEER	7339193491
MR. DAHYALAL	PLANT HEAD- FES	9408703335	MR. PRADIPTO	SR. ENGINEER	9408886099
MR. TEJAS KUMAR	PLANT HEAD SOP	9426896731	MR. RAM PRASAD	ASST. MANAGER	7698739633
MR. P. S SHEKHAWAT	SR. MANAGER	9409276080	MR. SUNDER PAL	ASST. MANAGER	9409305404

Duties of Incident Controller in case of Emergency:

Incident Controller will proceed to the place of emergency after hearing siren/announcement and will: -

- ❖ Assess the scale of emergency and decide if a major emergency exists or is likely, accordingly activate emergency procedure.
- ❖ Immediately give his feedback to Emergency Control Centre (ECC) regarding emergency.
- ❖ Direct all operations within the area with following priorities.
- ❖ Secure the safety of personnel
- ❖ Minimize damage to plant property and environment.
- ❖ Minimize loss of material.
- ❖ Direct rescue and fire-fighting operations carried out by Emergency Response Team till the arrival of the outside help.

- ❖ Ensure that the affected area is searched for causalities.
- ❖ Ensure that all non-essential workers in the affected area evacuate to the appropriate assembly point.
- ❖ Set up communication point to establish and contact as with emergency control centre (ECC).
- ❖ Pending arrival of Site Main controller, assume the duties of the post to:
- ❖ Direct the shutting down and evacuation of plant and areas likely to be threatened by emergency.
- ❖ Ensure that the outside emergency services have been called in.
- ❖ Ensure that the key personnel and Emergency Response Team members have been called in.
- ❖ Report all significant development to the Site Main Controller.
- ❖ Provide advice and information, as required to the Senior Officer.
- ❖ Preserve evidence that would facilitate any subsequent inquiry into the cause and circumstances of emergency.

DEPUTY INCIDENT CONTROLLERS

DEPUTY INCIDENT CONTROLLERS			Next Person in case of absence of Dy. Incident Controller		
Name	**Designation**	**Phone Number**	**Name**	**Designation**	**Phone Number**
MR. SANJAY SINGH	AGM	9428251150	MR. P SHEKHAWAT	SR. MANAGER	9409276080
MR. SANKATA SINGH	AGM	9429158619	MR. MANOJ VARIA	SR. MANAGER	9409302297
MR. VINAYAK	SR. MANAGER	9428896055	MR. MANAN DAVE	SR. MANAGER	9429109650

Fire Safety & Rescue Control

Fire & Safety Rescue Lead			Next Person in case of absence of Fire & Safety Rescue Lead		
Name	**Designation**	**Phone Number**	**Name**	**Designation**	**Phone Number**
MR. R. TAK	AGM	9409104656	MR. S. K SINGH	MANAGER	9429892747
MR. AWDHOOT	MANAGER	9427121483	MR. SURENDRA	ASSOCIATE EXE.	9429158647

Duties of Fire Safety & Rescue Leader in case of Emergency:

- ❖ Controlling and Combating Emergency at the Incident Place.
- ❖ Leading the ERT team till external help of firefighting squad is not available at Site.
- ❖ Carrying out rescue operations and ensure proper usage of safety appliances.
- ❖ Ensure casualty if any is shifted to dispensary.

Production /Safe Shut Down Activity During Emergency

Production Safe Shut Down leader	Next Person in case of absence of Leader

Name	Designation	Phone Number	Name	Designation	Phone Number
MR. RAKESH PATEL	DY. MANAGER ELECTRICAL	9426896935	MR. P. SASIKUMAR	DY.MANAGER	9409303290
MR. DINESH KUMAR	MANAGER INSTRUMENT	9426896985	MR. PANKAJ TOMAR	SR. ENGINEER	9429109654
MR. MITHILESH KUMAR	ASST. MANAGER	9428896040	MR. SHABIR SHAIKH	SR. ENGINEER	9428895939
MR. BAIPALI DIVAKAR	ASST.MANAGER WASHERY	9409305402	MR. VIPUL BARAD GOVIND BHAI	ENGINEER WASHERY	9408703403
CONTROL ROOM BROMINE	COMMON BROMINE	9099903557	MR. MANAN DAVE	SR. MANAGER BROMINE MECH.	9429109650
MR. RAJESH BALA	ASST. MANAGER	7339193491	CONTROL ROOM CO GEN	COMMON CO GEN	9429158613

Duties of Production Safe Shut down Leader:

❖ Instruct Supervisors / Operators to bring all running processes and operation to safe mode.

❖ Ensure all processes and operations are in safe shutdown mode before evacuating the plan as per emergency shutdown procedure.

Pollution Control & Toxicity Monitoring

Pollution Control & Toxicity Control Leader			Next Person in case of absence of Pollution Control & Toxicity Control Leader		
Name	**Designation**	**Phone Number**	**Name**	**Designation**	**Phone Number**
RAGHAV KUMAR	SR. MANAGER QA & QC	9429896994	SHIV SHUKLA	A.M	9664597042
Duties of Pollution Control & Toxicity Control Leader in case of Emergency: ❖ 1-Control air / liquid pollution taking effective measures to combat pollution such as neutralization, dilution etc. ❖ 2-Toxicity Monitoring at all conspicuous locations.					

Health & Medical Control

Health & Medical Control Leader			Next Person in case of absence of Health & Medical Control Leader		
Name	**Designation**	**Phone Number**	**Name**	**Designation**	**Phone Number**
DR.ATUL MORI	F.M.O	9408703404	OHC COMMON	MALE NURSE	9428506441
Duties of Health & Medical Control Leader in case of Emergency:					

- ❖ Co-ordinate with the male nurse for first Aid.
- ❖ Shifting serious patients to Hospital in Bhuj as per direction received from SMC

Evacuation, Crowd Control & Cordoning off area.

Evacuation, Crowd Control & Cordoning off. area Leader			Next Person in case of absence of Evacuation, Crowd Control & cordoning off area		
Name	**Designation**	**Phone Number**	**Name**	**Designation**	**Phone Number**
MR. MITUL	MANAGER	9429109655	MR. ASHUTOSH	DY. MANAGER	9409305490
MR. NEERAJ	ASST. MANAGER	9408703343	MR. MEET	ASSO..EX	9408703338

Duties of Evacuation, Crowd Control & Cordoning off Area Leader in case of Emergency:

- ❖ Crowd control at the incident place.
- ❖ Guiding personnel to move towards the Assembly point, for this purpose seeking help from plant personnel identified in respective areas.
- ❖ If required area to be barricaded.
- ❖ Ensuring Roads are free for Rescue vehicle movement.
- ❖ Co-coordinating vehicle movement.
- ❖ Assistance to Shift Inchrage to be ensure the opposite of plant main road from free form obstruction.

Advisor to Incident Controller

Advisor to Incident Controller			Next Person in case of absence of Advisor to Incident Controller		
Name	**Designation**	**Phone Number**	**Name**	**Designation**	**Phone Number**
MR. SANJAY SINGH	AGM	9428251150	MR. GANPATHY	AGM	9409305484

Duties of Advisor to incident Controller:

- ❖ To assess the severity of incident and give feedback to Incident Controller.
- ❖ Intimate to ERT leader, suggest.
- ❖ Kind of necessary steps required to control emergency and time to time review the effectiveness of action recommended after assistance with adviser of incident controller and ERT leader.
- ❖ To co-ordinate with Outside agencies for controlling emergency.
- ❖ After controlling emergency, give feedback to Incident Controller.

Engineering Support

Engineering Support Leader	Next Person in case of absence of Engineering Support Leader

Name	Designation	Phone Number	Name	Designation	Phone Number
MR. GANAPATHY	AGM-OPERATION	9409305484	MR. MANAN DAVE	SR. MANAGER	9429109650
MR. AMRUT	MANAGER	9427766077	MR. SAGAR MODI	ASST. MANAGER	9429818939

Duties of Engineering Support Leader:

- ❖ Ensuring proper functioning of the Hydrant pumps.
- ❖ Ensure Electrical shut down.
- ❖ Provide the lighting / Electrical Connection at incident spot.
- ❖ Ensuring availability of water for hydrant system.
- ❖ Ensuring availability of fitters and electricians & Instrument Technician for the emergency work with necessary tools.

Store Support

Store Support Leader			Next Person in case of absence of Store Support Leader		
Name	**Designation**	**Phone Number**	**Name**	**Designation**	**Phone Number**
MR. MANOJ VARIA	SR. MANAGER	9409303297	MR. PANKAJ PAUL	MANAGER STORE	9428896059

Duties of Store Support Leader

- ❖ Ensuring store is open and any item desired for handling emergency is made available quickly from the store.
- ❖ Ensuring availability of emergency lighting in the store.
- ❖ Ensuring Emergency PPEs cabinet key available at store which had equipped with safety appliance.

Transportation & Security

Transportation & Security Leader			Next Person in case of absence of Transportation & Security Leader		
Name	**Designation**	**Phone Number**	**Name**	**Designation**	**Phone Number**
MR. NEERAJ	ASSITANT MANAGER	9408703343	MR. ASHUTOSH	DY. MANAGER	9409305490

Duties of Transportation & Security Leader:

- ❖ Arrangements of Transportation and Security.
- ❖ Arrangements for Rehabilitation.
- ❖ Vehicle movement, guiding essential external services towards incident place.
- ❖ Ensure the Availability of Ambulance.

Assembly Point Management Leader

Assembly Point Management Leader			Next Person in case of absence Assembly Point Management Leader		
Name	**Designation**	**Phone Number**	**Name**	**Designation**	**Phone Number**
MR. MITUL	MANAGER HR	9429109656	MR. ARVIND	ASST. MANAGER	9426897078

Duties of Assembly Point Support Leader:

- ❖ Supervise activities at assembly area, Head count, and interaction with rescue team.
- ❖ Intimation to ECC about to head count.
- ❖ If any requirement occurred from incident place, mobilized the people for help.
- ❖ Ensuring the wind direction and if required change the location of assembly point.

Rehabilitation Management Coordinator

Rehabilitation Leader			Next Person in case of absence of Rehabilitation Leader		
Name	**Designation**	**Phone Number**	**Name**	**Designation**	**Phone Number**
Mr. RP SINGH	D.GM	9499899073	MR. R TAK	AGM	9409104656

Duties of Rehabilitation Management Coordinator:

- ❖ The people likely to get affected shall be identified and shall be rehabilitated to safe place under the direction of district administration as identified in Off-Site Emergency Plan.

❖ Make arrangement of the affected people for Medical Checkup, shelter Food & basic things.

Bromine ISO Container Outside Accident

Fire & Safety Rescue Lead			Next Person in case of absence of Fire & Safety		
Name	**Designation**	**Phone Number**	**Name**	**Designation**	**Phone Number**
MR. J S BEDI	SITE HEAD	9428252132	COL. ABHINAV	GM	9428251276

Duties of Evacuation, Crowd Control & Cordoning off Area Leader in case of Emergency:

❖ Contact with Nicer globe and Local authorities.
❖ Notify your depot and follow their advice.
❖ Advise to Isolate the area and keep people at a safe distance.
❖ Ensure any casualties are not in danger and get medical assistance if required.
❖ Notify emergency authorities

ACIL Emergency Response Team

Fire & Safety Rescue Lead	Next Person in case of absence of Fire & Safety

Emergency Response Team of ACIL.

After hearing the alert siren. Keep your operation become safe and after intimation to concern area shift-in charge reach to incident place for support. ERT members should always carry fire and safety appliances from his working area and reach to incident placed. Once reach to incident place imitate to ERT leader and keep themselves in que and wait for further instruction. Team members is to combat the emergency at the site and control the emergency and carry out rescue operations. This team will be working under direct control of Safety Lead/Fire Lead (ERT Leader). ERT Leaders Will report and assist to the Incident controller at Incident Site.

Duties of ERT Leader:

- ❖ Take control of the situation & coordinate the deployment of the ERTs arriving from various plants to the incident site in coordination with the Incident controller.
- ❖ Delegate to ERTs the required responsibilities to manage the emergency after acquiring information from the Incident controller.
- ❖ Ask the team to cordon the area to prevent entry of any other person other than the ERTs.
- ❖ Guide ERTs arrived from other plants to initiate and coordinate their first aid and evacuation activities as per the requirement of the situation.
- ❖ Arrange all additional resources & equipment for firefighting & rescue operations.
- ❖ Guide the Fire Team Members to initiate actions with suitable Emergency equipment's with extinguishing media.
- ❖ To check the actions taken by ERT teams and insure the all the actions should be safe.
- ❖ Injured personnel should be rescued safely and shifted to triage area for further treatment.

First Aider:

Duties: After hearing the alert siren. Keep your operation become safe and after intimation to shift-in charge reaches to OHC for suppor Only First aider who are not ERT member) should report to the OHC.

ANNEXURE - 18:

LIST OF TRAINED FIRSTAIDERS

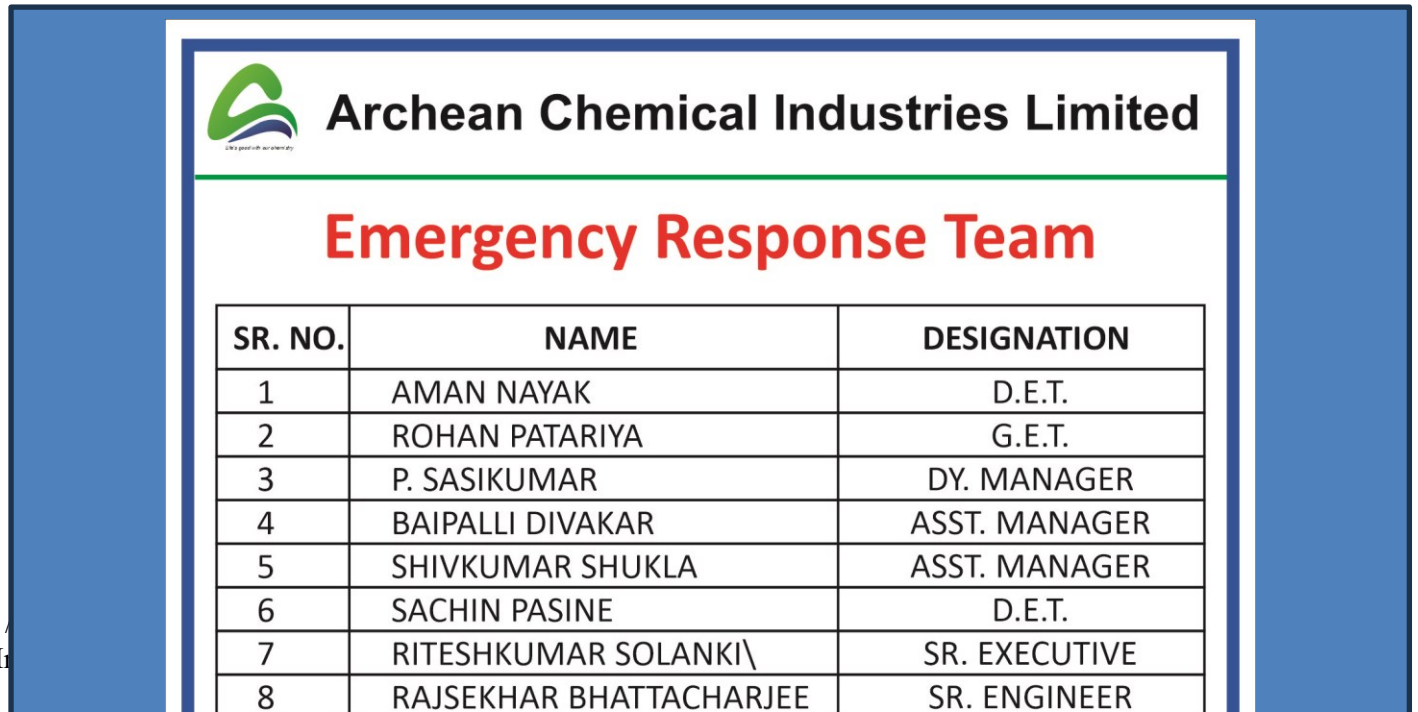
Archean Chemical Industries Limited

List of Trained First Aiders

Sr.No	Name of employees	Dept.	Mobile No.
1	RAJGOR BHAVIN	MECHANICAL	9484454520
2	MARIYA JOSEPH DAS	MECHANICAL	9428895940
3	J.MARTIN	PRODUCTION	9843822449
4	ANEESH KUMAR	WORKSHOP	9484509044
5	CHETAN MULDIYA	INSTRUMENT	8511034561
6	MANISH KUMAR VISHWAKRAM	PRODUCTION	8765790280
7	YASPALSINGH JADEJA	MECHANICAL	9409212396
8	SHIV KUMAR SUKLA	Q.C	9550271235
9	PANDYA KASHYAP	STORE	9429158669
10	VIPUL SHIYANJ	EHS	9408383096
11	NAITIK PUROHIT	BRINE FIELD	8128520627
12	RAJAN SOLANKI	PRODUCTION	9016874979
13	SONU VISHWKRAMA	BROMINE PROCESS	9408946022
14	JAYESH KANZARIYA	BROMINE MECHANICAL	9429248620
15	PARTH JOSHI	MECHANICAL WASHERY	9429892742
16	BARAD VIPUL KUMAR	QA.QC	9409472270
17	MAYUR KAMLIYA	ELECTRICAL	8460106716
18	RAM KRISHNA DRIVEDI	DESALINATION	9409157558
19	DIPAK BAGADA	DESALINATION	7284843530
20	SANDEEP SHARMA	SALT PRODUCTION	9409528131
21	POKAR HEVAL	BRINE FIELD	9428417613
22	SURENDRA SINGH GURJAR	EHS	9427989867
23	RAJSEKHAR BHATACHARYA	C&I	7048511035
24	RAMANAND JADAV	FES PRODUCTION	8530297082
25	PARAM PATEL	FES PRODUCTION	7359777900
26	ASHUTOSH RANJAN	SOP PRODUCTION	9601639138
27	BHAGIRATHSINGH VALA	ELECTRICAL	9924990812
28	RAVI SINGH	BROMINE PRODUCTION	6387310080
29	RAVI THANKI	CIVIL	9408703474
30	MUKESH KUMAR BUZAD	F&A	9429109653
31	RITESH SOLANKI	QA.QC	9429896993
32	AJAY SUKLA	TRANSPORT	9424334476

(ON-SITE / OFF-SITE
Chemical Industries Lin

LIST OF EMERGENCY RESPONSE TEAM (ERT)



Archean Chemical Industries Limited

Emergency Response Team

SR. NO.	NAME	DESIGNATION
1	AMAN NAYAK	D.E.T.
2	ROHAN PATARIYA	G.E.T.
3	P. SASIKUMAR	DY. MANAGER
4	BAIPALLI DIVAKAR	ASST. MANAGER
5	SHIVKUMAR SHUKLA	ASST. MANAGER
6	SACHIN PASINE	D.E.T.
7	RITESHKUMAR SOLANKI\	SR. EXECUTIVE
8	RAJSEKHAR BHATTACHARJEE	SR. ENGINEER

ANNEXURE - 19 : SAFE ASSEMBLY POINTS

Identification Sr. No. of Assembly Points	Location	Accommodation	AT THE TIME OF EMERGENCY PERSON INCHARGE Place of Availability Name & Desig.	In the Factory	Phone Number Residence Address	Nearest Phone No.	PPEs Required
1	ADM Building	100	Mr. Ashutosh Mishra	411	Nakhatrana	9409305490	Person incharge to co-ordinate
2	Near HT Switch Yard	100	Mr. Vinayak	407	Nakhatrana	9429892743	Person incharge to co-ordinate
3	Infront of Central Store	200	Mr. Manoj Varia	431	Nakhatrana	9409303297	Person incharge to co-ordinate

ANNEXURE - 20 : EMERGENCY CONTROL CENTER

Location of the Centre : [1] Infront Of Admin Building and Safety Office 24X7					
Telephone No.: 100/101					
Sr.	Items to be kept in the Centre [See 1 to 10 - Page 32-33]	Numbers of Quantity	Person who will handle/operate this item	Time of Operation	Note
1	Chart Showing the Address of Key Personnel	ONE	Mr. Mitul Gusai		PPE will be checked at regular intervals and will be maintained by Mr. Sujeet Kumar Singh- Manager- Safety
2	Internal & External Phone Directory	ONE	Mr. Mitul Gusai		
3	Plot Plan Showing : A. Hazardous Location B. Location of Siren C. Location of Assembly Point D. Location of E.C.C. E. Ambulance / First Aid Center	ONE	Mr. Sujeet Kumar Singh		
4	Document Files A. Emergency Blood Group	ONE	Dr. Atul Mori		
5	Notes, Pencils, Pads, Etc.,	6 nos	Mr. Neeraj Sharma		
6	Few Copies of On-Off Site Emergency Plan	2 nos.	Mr. Sujeet Kumar Singh		
7	Personal Protective Equipments	As per Annexure 21B(2)	Mr. Sujeet Kumar Singh		

ANNEXURE - 21 : FIRE AND TOXICITY CONTROL ARRANGEMENTS[A]

Fire Water : No. of Aboveground Tank : - 02 Total Water Storage Capacity : - 6000 m3										No. of Fire Extinguishers
					No. of/ Monitors					
					FIXED (09 Nos.)		PORTABLE (1 No.)			
Other Sources & Capacity	No. of Hydrant Points	No. of Fire Pumps, Types & Capacities	No. of Hose Reels & Total Length	No. of Fire Tenders & Capacity	Lifting Height	Pressure	Lifting Height	Pressure	Alternate Power Arrangements	
Fire pump house	40	• Main Pump Capacity: 273 M3/hr	108*2 Each of	N.A	--	--	--	--	DG Set	See details below

• Diesel Pump Capacity: 273 m3/hr • Jockey Pump Capacity: 10.8 M3/hr • Jockey Pump Start Pressure: 5 Kg/cm2 • Jockey Pump Stop Pressure: 7 Kg/cm2 • Main Pump Start Pressure: 3.5 Kg/cm2 Main Pump Stop Pressure: Manual	15Mtr. Length.

DETAILS OF FIRE HYDRANT SYSTEM:

1. Fire Water Capacity: 600 KL
2. Main Pump Capacity: 273 M3/hr
3. Stand By Diesel Pump Capacity: 273 m3/hr
4. Jockey Pump Capacity: 10.8 M3/hr
5. Jockey Pump Start Pressure: 5 Kg/cm2
6. Jockey Pump Stop Pressure: 7 Kg/cm2
7. Main Pump Start Pressure: 3.5 Kg/cm2
8. Main Pump Stop Pressure: Manual

ANNEXURE – 21 –B (1) : FIRE AND TOXICITY CONTROL ARRANGEMENTS[1]

FIRE EXTINGUISHER DETAILS

SR.NO	PLANT	LOCATION	DIRECTION	DCP (9KG)	DCP(6KG)	CO2(4.5)	CO2(3.2)	CO2(2)	WATER	MACH FOAM	TEC (9KG)	TEC(6 KG)	FOAM (50KG)	CLEAN AGENT
1	Bromine 1	G/F	FRONT SIDE	0	3	0	0	0	0	1	O	0	0	0
2		F/F	FRONT SIDE	1	0	1	0	0	0	1	1	0	0	0
3		S/F	FRONT SIDE	2	0	2	0	0	0	0	0	0	0	0
4		G/F	BACK SIDE	1	1	2	0	0	0	0	0	0	0	0
5		F/F	BACK SIDE	0	4	0	0	0	0	0	0	0	0	0
6		S/F	BACK SIDE	0	0	2	0	0	0	1	0	0	0	0
7	Bromine 2	G/F	FRONT SIDE	0	4	0	0	0	0	0	0	0	0	0
8		F/F	FRONT SIDE	3	1	0	0	0	0	0	0	0	0	0
9		S/F	FRONT SIDE	0	1	2	0	0	0	1	0	0	0	0
10		G/F	BACK SIDE	0	2	2	0	0	0	0	0	0	0	0
11		F/F	BACK SIDE	1	1	2	0	0	0	0	0	0	0	0
12		S/F	BACK SIDE	0	3	0	0	0	0	1	0	0	0	0
14		F/F	FRONT SIDE	3	0	2	0	0	0	0	0	0	0	0
15		S/F	FRONT SIDE	1	3	0	0	0	0	0	0	0	0	0
16		G/F	BACK SIDE	4	2	2	0	0	0	0	0	0	0	0
17		F/F	BACK SIDE	3	4	1	0	0	0	0	0	0	0	0
18		S/F	BACK SIDE	5	1	2	0	0	0	0	0	0	0	0
19	FES	G/F	FRONT SIDE	0	4	0	0	0	0	0	0	0	0	0

20		F/F	FRONT SIDE	0	4	0	0	0	0	0	0	0	0	0
21		S/F	FRONT SIDE	0	4	0	0	0	0	0	0	0	0	0
22		T/F	FRONT SIDE	0	4	0	0	0	0	0	0	0	0	0
23		G/F	BACK SIDE	0	4	0	0	0	0	0	0	0	0	0
24		F/F	BACK SIDE	0	2	2	0	0	0	0	0	0	0	0
25		S/F	BACK SIDE	0	2	2	0	0	0	0	0	0	0	0
26		T/F	BACK SIDE	0	4	0	0	0	0	0	0	0	0	0
27		G/F	CENTER /SOUTH	0	3	0	0	0	O	O	O	O	O	0
28		F/F	CENTER/NORTH	O	2	O	O	O	O	O	O	O	O	0
29		S/F	CENTER/SOUTH	0	2	O	O	O	O	O	O	O	O	0
31		F/F	FRONT SIDE	O	1	1	O	O	O	O	O	O	O	0
32	Washery	S/F	FRONT SIDE	O	2	1	O	O	O	O	O	O	O	0
33		T/F	FRONT SIDE	O	2	1	O	O	O	O	O	O	O	0
34		4F/F	FRONT SIDE	O	3	O	O	O	O	O	O	O	O	0
35		T/F	CENTER /NORTH	3	O	O	O	O	O	O	O	O	O	0
36		T/F	CENTER/EAST	3	O	O	O	O	O	O	O	O	O	0
120	WORKSHOP	GF	EAST SIDE	1	1	1	0	0	1	0	0	0	0	0
121	Co-gen	GF	FRONT SIDE	O	0	1	0	0	0	1	0	0	0	0
	TOTAL	**490**		**95**	**153**	**114**	**9**	**12**	**38**	**52**	**2**	**2**	**5**	**8**

ANNEXURE – 21 –B (2) : FIRE AND TOXICITY CONTROL ARRANGEMENTS

[2] ## Personal Protective Equipment

PERSONAL PROTECTIVE EQUIPMENTS AND OTHER ITEMS	QTY AT ECC	QTY AT MAIN GATE	QTY IN SAFETY STORE	QTY IN CENTRAL STORE
Cartridge mask for Mixed gas	10	10	10	15
Full Face shield with cartridge	01	0	8	0
Goggles	5	0	10	5
Gum Boots (pairs)	05	3	12	06
Rubber orange Hand gloves 12”	10	3	20	20
Rubber orange Hand gloves 24”	05	0	10	10
Asbestos Hand gloves	05	3	10	5
Air Bubbler	05	3	06	05
PVC Aprons/ TYVCK (Shirt-Pant)	5	3	04	05
Press. Suit	02	0	02	02
Helmets	05	5	04	02
Face Shield	05	3	05	03
Fire Proximity Suit	0	0	0	0
Cotton Mask	50	0	50	50
Ear Plug	5	0	0	5
Surgical Hand gloves	10	0	20	50
Full Body harness	01	0	01	01

LOCATION OF S.C.B.A. SETS IN THE COMPANY

Sr.No.	ID No.	Location	Sr.No.	ID No.	Location	Sr.No.	ID No.	Location
1	BA -01	SAFETY STORE	04	BA-04	FES	07	BA-07	CL2 Storage
2	BA-02	Bromine FF	05	BA-05	FES	08	BA-08	ECC
3	BA-03	ISO Container AREA	06	BA-06	CL2 Storage	09	BA-09	ECC

LOCATION OF EYE WASHER AND SAFETY SHOWER

1	FES	SW-01	Acid Storage Tank	8	Bromine-1	SW-08	Storage Tank
2	FES	SW-02	ABO Tower	9	Bromine-1	SW-09	Caustic Tank
3	FES	SW-03	CL2 Yard	10	Desal	SW-10	Acid Storage Tank
4	FES	SW-04	Chemical Barrel Store	11	Desal	SW-11	Common Tank
5	Bromine-2	SW-05	Bottling	12	OHC	SW-12	Decontamination Center
6	Bromine-2	SW-06	CL2 Yard	13	Lab	SW-13	Analysis room
7	Bromine-2	SW-07	Caustic Tank	14	Bromine Common	SW-14	Br2 Bottle Storage

FIRE AND TOXICITY CONTROL ARRANGEMENTS
(c) List of Gas Detectors

Sr. No.	Plant	Location	Sensor Type	Identification
1	Bromine	Ground Floor	BROMINE	GD/001
2	Bromine	1St Floor	BROMINE	GD/002
3	Bromine	2nd Floor	BROMINE	GD/003
4	Bromine	3rd Floor	BROMINE	GD/004
5	Bromine	4th Floor	BROMINE	GD/005
6	Bromine	Chlorine Charging Area	CHLORINE	GD/006
7	Bromine	Chlorine Charging Area	CHLORINE	GD/007
8	Bromine	Chlorine Charging Area	CHLORINE	GD/008
9	Bromine	Chlorine Charging Area	CHLORINE	GD/009
10	Bromine	Chlorine Charging Area	CHLORINE	GD/10
11	Bromine	Chlorine Charging Area	CHLORINE	GD/011
12	Bromine	Chlorine Charging Area	CHLORINE	GD/12
13	Bromine	Chlorine Charging Area	CHLORINE	GD/13
14	Bromine	Chlorine Charging Area	CHLORINE	GD/14
15	Bromine	Chlorine Charging Area	CHLORINE	GD/15
16	Bromine	Chlorine Charging Area	CHLORINE	GD/16
17	Bromine	Chlorine Charging Area	CHLORINE	GD/17

18	Bromine	Chlorine Charging Area	CHLORINE	GD/18
19	FES Plant	ABO-01	HBR	GD/19
20	FES Plant	ABO-02	HBR	GD/20
21	FES Plant	ABO-03	HBR	GD/21
22	FES Plant	ABO-04	HBR	GD/22
23	FES Plant	ABO-05	HBR	GD/23
24	FES Plant	ABO-06	HBR	GD/24
25	FES Plant	ABO-07	HBR	GD/25
26	FES Plant	ABO-05	HBR	GD/26
27	FES Plant	ABO-06	HBR	GD/27
28	FES Plant	ABO-07	HBR	GD/28
29	FES Plant	Sulfur Melter Area	SO2	GD/29
30	FES Plant	Sulfur Melter Area	SO2	GD/30

ANNEXURE – 22: MEDICAL ARRANGEMENTS [A]

For Key Personnel & essential workers see Annexure - 17 & 18
First Aid Centers / Ambulances / OHP / Hospitals

Sr.	Name & Location	Location and Phone Nos.	In charge Person Name & Address	Facilities & Equipments.	Antidotes Available	Accommodation	Places of Availability	Capacity	Facilities in Van	Drivers Name & Address
First Aid Center										
1.	Occupational health centre	Near Admin Building (101)	Factory Medical Officer (In Normal Working Hrs)	Emergency and General medicines 1 Ambu bag 1 Diphoterine Kit 2 Oxygen cylinders with central oxygen line 1 Nebulizer machine 1 Glucometer	Anti Snake Venom - 1 No Specific Antidotes for	02 Observation beds 01 Ambulance (Force –	Additional first aid kits are available at below mentioned location		Stretcher Oxygen Cylinder with key First aid kit emergency medicines fire extinguisher Blanket, Pillow Water gel blanket	Baluba and Naren Maheshwari. 9828506441

			Male Nursing Officer (24 Hrs)	1 Pulse-oxy meter Dressing table & dressing trolley Stitching material 1 BCA (CHE test) kit 1 Suction machine 1 stretcher 1 spine board 1 Portable eye-showers 1 Automated external defibrillator (AED) 1 Water gel blanket 1 Multi para monitor 1 Weight machine 1 X-ray viewer box 1 Electronic Vision chart 1 Cell counter machine	Bromine and Chlorine	(Traveller GJ12 X3495)	* Ambulance * Visitor room, Main gate		Stretcher Oxygen Cylinder with key First aid kit emergency medicines fire extinguisher Blanket, Pillow Water gel blanket	

ANNEXURE – 22: MEDICAL ARRANGEMENTS [B]

For Key Personnel & essential workers see Annexure - 17 & 18								
Doctors [All Nearby]				Other Medical Staff		Mutual Aid Arrangements		
Name & Address	HOSPITAL		Approx. Distance	CONTACT		FACILITIES AVAILABLE		
	Phone	Address		Person	Phone	Accom.	Eqpts.	Ambulance
Ayush Hospital Nakhatrana	075740 88878	Vivan Arcade, Matana Madh Highway, above Katira Imaging, Nakhatrana, Nagalpar, Gujarat 370615	70 KM	Mr. Tejas Mehta	9408703404	Yes	**1.1 General Equipment** 1. **Patient Beds**: Adjustable hospital beds for patient comfort. 2. **Stretchers**: For transporting patients. 3. **Wheelchairs**: For patient mobility.	Yes

							4. **Infusion Pumps**: For delivering fluids and medications. 5. **Suction Machines**: To clear airways and suction fluids. 6. **Oxygen Concentrators**: For providing supplemental oxygen. 7. **Electrocardiogram (ECG) Machines**: To monitor heart activity. 8. **Vital Signs Monitors**: To track patient heart rate, blood pressure, temperature, and oxygen saturation. 9. **Defibrillators**: For emergency cardiac care. 10. **Ventilators**: For assisting or controlling breathing. **1.2 Diagnostic Equipment** 1. **Stethoscopes**: For auscultation of heart and lung sounds. 2. **Blood Pressure Monitors**: For measuring blood pressure. 3. **Thermometers**: For checking body temperature. 4. **Glucometers**: For monitoring blood sugar levels.	

							5. **X-ray Machines**: For imaging and diagnostics. 6. **Ultrasound Machines**: For non-invasive imaging. **1.3 Surgical Equipment** 1. **Surgical Instruments**: Basic sets including scalpels, scissors, forceps, and needle holders. 2. **Operating Tables**: Adjustable tables for surgical procedures. 3. **Surgical Lights**: For illumination during surgeries. 4. **Anesthesia Machines**: For administering anesthesia. **1.4 Laboratory Equipment** 1. **Microscopes**: For examining samples. 2. **Centrifuges**: For separating components of blood or other fluids. 3. **Refrigerators**: For storing medications, vaccines, and specimens. **1.5 Miscellaneous Equipment**	

							1. **Disinfecting Supplies**: For maintaining cleanliness and hygiene. 2. **Personal Protective Equipment (PPE)**: Including gloves, masks, and gowns. 3. **Emergency Kits**: Containing first aid supplies and essential medications.	
K.K Patel Super Specialty Hospital-Bhuj	091043 12022	Bhuj - Mundra Road, University, nr. Kutch, Bhuj, Gujarat 370001	120 KM	Trupti Sonthaliya	091043 12022	Yes	**1.6 General Equipment** 1. **Patient Beds**: Adjustable hospital beds for patient comfort. 2. **Stretchers**: For transporting patients. 3. **Wheelchairs**: For patient mobility. 4. **Infusion Pumps**: For delivering fluids and medications. 5. **Suction Machines**: To clear airways and suction fluids. 6. **Oxygen Concentrators**: For providing supplemental oxygen. 7. **Electrocardiogram (ECG) Machines**: To monitor heart activity. 8. **Vital Signs Monitors**: To track patient heart rate,	

							blood pressure, temperature, and oxygen saturation. 9. **Defibrillators**: For emergency cardiac care. 10. **Ventilators**: For assisting or controlling breathing. **1.7 Diagnostic Equipment** 1. **Stethoscopes**: For auscultation of heart and lung sounds. 2. **Blood Pressure Monitors**: For measuring blood pressure. 3. **Thermometers**: For checking body temperature. 4. **Glucometers**: For monitoring blood sugar levels. 5. **X-ray Machines**: For imaging and diagnostics. 6. **Ultrasound Machines**: For non-invasive imaging. **1.8 Surgical Equipment** 1. **Surgical Instruments**: Basic sets including scalpels, scissors, forceps, and needle holders. 2. **Operating Tables**: Adjustable tables for surgical procedures.	

							3. **Surgical Lights**: For illumination during surgeries. 4. **Anesthesia Machines**: For administering anesthesia. **1.9 Laboratory Equipment** 1. **Microscopes**: For examining samples. 2. **Centrifuges**: For separating components of blood or other fluids. 3. **Refrigerators**: For storing medications, vaccines, and specimens. **1.10 Miscellaneous Equipment** 1. **Disinfecting Supplies**: For maintaining cleanliness and hygiene. 2. **Personal Protective Equipment (PPE)**: Including gloves, masks, and gowns. 3. **Emergency Kits**: Containing first aid supplies and essential medications.	

ANNEXURE - 23: TRANSPORT & EVACUATION ARRANGEMENT [A]

Sr No.	Vehicle	Location	Quantity	Capacity	Person In-charge
1.	Trax	Main Security Gate	11	11 persons each	Neeraj Sharma Admin (Asst. Manager)
2.	Bus	Main Security Gate	3	56 person each	
3.	Ambulance	Main Security Gate	1	01 Person each	

1]	Mr. Neelkanth Salt Chem India Pvt. Ltd.	5 kms		Mr. Mavji Malstar

ANNEXURE – 23 –C (1): MUTUAL AID ARRANGEMENT – FACILITIES [C]

Sl. No.	Details	M/s Archean Chemical Industries Limited- Hajipir, Kachchh.	M/s Agrocel Industries Pvt. Ltd. - Hajipir, Kachchh.
1	Contact Person	1. Mr. RP Singh 9499899073 2. Mr. Rajendra Tak 9409104656	1. 2.
2	Fire	1. Fire Extinguishers- 200 Nos 2. Water- 100 KL 3. Foam Compound-30 Liters	1. Fire Extinguishers- 200 Nos 2. Water- 100 KL 3. Foam Compound-30 Liters
3	First Aid	1. Ambulance with Driver 2. Medical Assistance 3. Medical Oxygen Cylinder	1. Ambulance with Driver 2. Medical Assistance 3. Medical Oxygen Cylinder
4	PPE'S	1. SCBA Set- 04 Nos 2. Multi Acid/ Alkali Gas Proof Canister Mask- 10 Nos 3. Chemical Hand gloves- 30 Pair 4. Full Body Suit- 02 Nos 5. Chemical Resistant Boot-05 Pair 6. Chemical Shield- 02 Nos	1. SCBA Set- 04 Nos 2. Multi Acid/ Alkali Gas Proof Canister Mask- 10 Nos 3. Chemical Hand gloves- 30 Pair 4. Full Body Suit- 02 Nos 5. Chemical Resistant Boot-05 Pair 6. Chemical Shield- 02 Nos
05	Neutralizing Agent	1. Sodium Thiosulfate- 500 Kg 2. Lime- 1000 Kg	1. Sodium Thiosulfate- 500 Kg 2. Lime- 1000 Kg
06	ERT Member	1. At least 05 ERT Member	At least 05 ERT Member
07	Emergency Boat	1. Emergency Boat - 1 Capacity: 5 Person	Emergency Boat - 1 Capacity: 5 Person
08	Lifebuoy Jacket	1. Lifebuoy Jackets – 05 Nos	Lifebuoy Jackets – 05 Nos
09	Shelter	1. Temporary Shelter at Nara Village	Temporary Shelter at Nara Village

ANNEXURE – 27 : CUG LIST

S.N	STATUS	EMP CODE.	NAME	DEGISNATION	DEPARMENT
1	Active	60796	VINAYAK	SR.MANAGER	ELECTRICAL
2	Active	60187	MAHIPAT SINGH FUL	ENGINEER	ELECTRICAL
3	Active	60207	P. SASIKUMAR	ASST.MANAGER	ELECTRICAL
4	Active	Common	ELECTRICALS COMMON	COMMON	ELECTRICAL
5	Active	60327	RAKESH KUMAR PATEL	DY. MANAGER	ELECTRICAL
6	Active	60432	FUL MEGHRAJI	ENGINEER	ELECTRICAL
7	Active	Common	COMMON USE	COMMON	ELECTRICAL
8	Active	Common	NARA SPEZZO METTER	COMMON	INSTRUMENT
9	Active	60456	PATAT VIJAY	ASST.MANAGER	INSTRUMENT
10	Active	60802	PANKAJ SINGH	MANAGER	INSTRUMENT
11	Active	60539	SANKATA KUMAR SINGH	AGM INSTRUMENTATION	INSTRUMENT
12	Active	60534	DINESH KUMAR	DY. MANAGER	INSTRUMENT
13	Active	60631	BHAVIK THAKKER	ENGINEER	INSTRUMENT
14	Active	Common	COMMON USE	COMMON	INSTRUMENT
15	Active	Common	PS-5 TELEMETRY SYSTEM	COMMON	INSTRUMENT
16	Active	Common	CONTROL ROOM	COMMON	DESALINATION
17	Active	60462	COMMON DCS	COMMON	DESALINATION
18	Active	60462	ALUGURAJ	SR.MANAGER	DESALINATION
19	Active	60370	MITHILESH KUMAR	ENGINEER	DESALINATION
20	Active	60213	SHABIR SHAIKH	ENGINEER	DESALINATION
21	Active	60335	NIRMAL CHAVDA	ASST.MANAGER	DESALINATION
22	Active	60373	RAM KRISHNA	ENGINEER	DESALINATION
23	Active	60446	PRAKASH CHANDRA SHRIMALI	SR. FACTORY ASST.	MECH.(SOP)
24	Active	60457	JASHPAL SINGH JADEJA	ENGINEER	MECH.(SOP)
25	Active		VIJAY RAGHAVAN	GM	GM
26	Active	Common	BROMINE 1 & 2	COMMON	MACHANICAL
27	Active	60074	VIPUL BARAD GOVIND BHAI	ENGINEER	WASHERY
28	Active	60223	BAIPALI DIVAKAR	ASST.MANAGER	WASHERY
29	Active	60067	JOSHI PARTH VIPULBHAI	ASST.MANAGER	WASHERY
30	Active	60100	SUNDARPAL SHARMA	ASST.MANAGER	WASHERY

31	Active	60103	PRAVENDRA SINGH SHEKHAWAT	SR. MANAGER	WASHERY
32	Active	60123	MARIYA JOPERSH DOSS		WASHERY
33	Active	60183	DANSANGJI PADHIYA		WASHERY
34	Active	60340	JANAKIROA CHOKKARA		WASHERY
35	Active	60341	PRASAD DERANGULA		WASHERY
36	Active	60376	KHANJI RAYABJI FUL		WASHERY
37	Active	60445	PRAKASH CHANDRA SAVARAN		WASHERY
38	Active	60620	SANDIP DABASIYA		WASHERY
39	Active	60684	CHAVDA DIPAK	ASST EXCT.	WASHERY
40	Active	60346	BIJAY RAJ SUMAN	SR. EXCT	ADMIN
41	Active	60849	MAYUR JOSHI	DY. MANAGER	ADMIN
42	Active	Common	MEET PITRODA	ASST EXCT.	ADMIN
43	Active	60062	ABDUL KARIM SAMA	CANTEEN SUPERVISOR	ADMIN
44	Active	60063	VAHED NODE	CANTEEN SUPERVISOR	ADMIN
45	Active	60244	SHIVAM KUMAR SRIVASTAV	ENGINEER	ADMIN
46	Active	Common	VISITOR SECURITY GATE	COMMON	ADMIN
47	Active	Common	B.S.F SECURITY GATE	COMMON	ADMIN
48	Active	Common	PLANT SECURITY GATE	COMMON	ADMIN
49	Active	60693	ARVIND VAROTRA	SR. EXCT	HR P&C
50	Active	60824	BHAVESH ZANTIYA	EXCT	HR P&C
51	Active	60837	MITUL GUSAI	MANAGER	HR P&C
52	Active	60056	GOVIND DANABHAI MALSATAR	SR. MANAGER	MECH.(B.F)
53	Active	60052	MAHESH BHIMABHAI CHAVDA	SR. ENG	MECH.(B.F)
54	Active	60072	MAHESHWARI DIPAK PUNJABHAI	ENGINEER	MECH.(B.F)
55	Active	60068	CHAUHAN MULAJI VAKHAJI	ENGINEER	MECH.(B.F)
56	Active	Common	PUMP STATION NO.1	COMMON	MECH.(B.F)
57	Active	Common	PUMP STATION NO.5	COMMON	MECH.(B.F)
58	Active	Common	PUMP STATION NO.3	COMMON	MECH.(B.F)
59	Active	Common	PUMP STATION NO.2	COMMON	MECH.(B.F)
60	Active	Common	PUMP STATION NO.4	COMMON	MECH.(B.F)
61	Active	Common	PUMP STATION RAW WATER POND	COMMON	MECH.(B.F)
62	Active	60061	CHAMAN KUMAR MISHRA	SR. ENG	ELECTRICAL.(B.
63	Active	60084	JAGMAL SINGH RATHOR	MANAGER	ELECTRICAL.(B.
64	Active	60070	THANKI RAVI HARISHBHAI	SR. ENG	BRINE FIELD
65	Active	60248	S.R.MAKWANA	SR. ENG	BRINE FIELD
66	Active	60342	PRAFULKUMAR BAROT	ENGINEER	BRINE FIELD
67	Active	60080	SIJU NARAN MAGAN	ENGINEER	BRINE FIELD(CIVIL)
68	Active	60338	KRISHNAN M	DY. MANAGER	BRINE FIELD(CIVIL)
69	Active	60060	HITESH P. CHHABHAIYA	ASST MANAGER	BRINE FIELD(CIVIL)

70	Active	80001	PRAKASH V NAIK	CONST.	CIVIL
71	Active	60920	MAYUR CHAUHAN	DY. MANAGER	CIVIL
71	Active	60137	BUZZAD MUKESH KUMAR	ASST.MANAGER	ACCOUNTS
72	Active	60899	HEET GOR	MANAGER	ACCOUNTS
73	Active	60765	MUNIR BOGHRA	EXCT	ACCOUNTS
74	Active	60769	SAMBHU CHAVDA	ASST EXCT.	ACCOUNTS
75	Active	60744	KULDEEP MISRA	ASST EXCT.	DISPATCH
76	Active	60331	AVANISH KUMAR SHRIVASTAVA	ASST MANAGER	DISPATCH
77	Active	60334	PANKAJ PAUL	MANAGER	STORE
78	Active	60692	JAGDISH KHER	ASST MANAGER	STORE
79	Active	60334	PANKAJ PAUL (STORE , DISEAL)	COMMON	STORE
80	Active	60739	KASHYAP PANDYA	ASST EXCT.	STORE
81	Active	60759	SARUPAL NAKUM	EXCT	STORE
82	Active	60107	HEMANNA G TIRAKANNAVAR	AGM COGEN	CO GEN
83	Active	Common	CONTROL ROOM CO GEN	COMMON	CO GEN
84	Active		DR.BHAVANISINH SODHA	DOCTOR	O H C
85	Active	Common	EMERGENCY NUMBER	COMMON	O H C
86	Active	Common	AMBULANCE	COMMON	O H C
87	Active	60880	SUJEET SINGH	MANAGER	SAFTY
88	Active	60626	RAJENDRA PRASHAD TAK	AGM EHS	E.H.C
89	Active	Common	CONTROL ROOM BROMINE	COMMON	BROMINE
90	Active	60031	MANAN DAVE	SR. MANAGER	BROMINE MECH
91	Active	60932	HARITAV KUMAR	MANAGER	FES MECH.
92	Active	60781	DAYABHAI PATEL	MANAGER	BROMINE PRO.
93	Active	60351	MADHAV CHANDRA BEHRA	SR. ENG	BROMINE PRO.
94	Active	60777	MR. DHAVAL SINH	MANAGER	BROMINE PRO.
95	Active	Common	CENTRAL LAB	COMMON	QA & QC
96	Active	Common	BROMINE LAB.		QA & QC
97	Active	60271	RITESH SOLANKI	SR. ENG	QA & QC
98	Active	60770	RAGHAV KUMAR	SR. MANAGER	QA & QC
99	Active	60319	TEJASH KUMAR	SR. MANAGER	S.O.P.
100	Active	60225	ASHVIN P. VITHALPARA		S.O.P.
101	Active	Common	D.C.S.PROCESS	COMMON	S.O.P.
102	Active	60259	RAM PRASAD(SOP PROCESS)		S.O.P.
103	Active		MR.SUBHAS KASINATHAN	GM	GM
104	Active		BHUPATHI SIR	VP SIR	V.P (UNIT HEAD
105	Active	60691	PRASHANT JOSHI		LOGISTICK
106	Active	60745	AJAY SUKLA		TRANSPORT
107	Active	60745	FOR VEHICAL GPS METER		TRANSPORT
108	Active	60244	FOR VEHICAL GPS METER		TRANSPORT
109	Active	60807	RAVI SINGH	MANAGER	TRANSPORT

110	Active	60158	PURSHOTTAMBHAI SOLANKI		ETP
111	Active	60176	DIGAMBER D VIKHE	DY. MANAGER	ETP
112	Active	60918	B.GANAPATHY	AGM OPS.	OPERATION
113	Active	Common	FLOW-METER PAPDI	COMMON	INSTRUMENT
114	Active		BHUPATHI SIR	VP SIR	V.P (UNIT HEAD
115	Active	60539	SANKATA KUMAR SINGH	AGM INSTRUMENTATION	INSTRUMENT
116	Active		SUBHASH SIR	GM	GM
117	Active	60818	RITESH PAREKH	SR. MANAGER	TECHNICAL
118	Active	60836	WATER MASTER (NEW MACHINE)		IT CCTV CAMER
119	Active		Mr. GURURANGARAJAN	ASST OF ED	
120	Active	60908	Mr. RANA DIGVIJAY SINH	MANAGER	PRODUCTION
121	Active	60906	Mr. AMZAD KHAN	SR. MANAGER	HR & ADMIN
122	Active	60907	Mr. AVADHOOT SEVAK	MANAGER	SECURITY

ANNEXURE – 27D: EMERGENCY COMMUNCIATION

EMERGENCY CONTROL CENTER: **100/ 9429158647**

ANNEXURE - 29 : NOMINATED PERSON TO DECLARE MAJOR EMERGENCY

Sr.	Name of the plant, Dept., or Location	Name & Designation of the Nominated Person to Declare Major Emergency	Duty or Designation, if any, given under the On-Site/Off-Site Emergency Plan	Phone No. [Internal]	Residence Phone No.	Residence Address
1]	Plant as a whole	Site Main Controller	As per feed back from incident controller to inform at emergency gate for declaring emergency Co-ordination with ECC & Incident controller to tackle emergency. Co-ordination with outside agency. Co-ordination for Head count Overall responsibility of situations.	Mbl: 9428252132		Nakhatrana

ANNEXURE - 30 : A FORM TO RECORD EMERGENCY TELEPHONE CALL

PART - A : ESSENTIAL INFORMATION

Details of Call Reported :			
Callers Name & Designation:	Date :	Time :	Ph. No.:
Purpose of Call & Any Particular:			
Advice required Immediately:			
Name of Chemicals to be spelt out Clearly:			
Brief Description of the Incident/Fire/Explosion/Liquid Spill/Gas Release:			
Quantity involved :			
Packing/Storing/Handling/Using details:			
Location of Incident:			
Cause, If know, in breif:			

PART - B : INFORMATION TO BE OBTAINED IF READILY AVAILABLE

Has anyone be injured or affected by Chemicals:	yes/no	If yes, How Many :
What First Aid has been given:		
Has any one been taken to Hospital:	yes/no	
If yes, Address of Hospital:		
Is the Road Blocked:	yes/no	Closed to Traffic: yes/no
Who Owns the Chemicals & has the owner been informed:		
Incident caused by the Vehicle :	Vehicle No.: _____	Name & Address of the Owner : _____
		Who was the load Consigned : _____

ANNEXURE - 32: SEPARATION DISTANCES

Sr. No.	Material	Location	No. of tanks	Qty.	Separation distance (in meters)
1.	Petroleum Class A	Diesel Pumo	Carboy	300 Liter	15 meters
2.	Petroleum Class B	Diesel Pump	2	40 Kl	15 meters
3.	Chlorine	Chlorine Station	649 Toner	5,84,100 MT	9 Meter
4.	SO2 Tonner	Chlorine Station	242 Toner	2,17,800 MT	15 Meter

ANNEXURE-34: CHEMICAL/PHYSICAL/TOXICOLOGICAL/FIRE DATA

Sr. No.	Common Name	Chemical Name	Physical stage	CAS No	NFPA Classification				Use	storage Details							Is it carcinogen(C), mutage(M)n or reprotoxicR,		
			Solid/Liquid/Gas/Other		Health	Fire	Reactivity	Specific Hazard - Oxidiser / Acid/ Alkaline/ Corrosive/ Use No water/ Radiation	Material used as Raw Material/Intermediate/Finished Prod.	Type of storage Above ground, Undergorund,Godown, Other	Pressurised/atmospheric	Tan/Drum/Cylinder/ Bags/carbuoys	Numbers	Total Capacity	Unit KL/Tonnes	Licence requirement Yes/No	Carcinogen	Mutagen	Reprotoxic
1	BROMINE	Br_2	G	7726-95-6	3	0	0	OXY	FP	Above ground	Atm	Tank	4	60	KL	No	No	No	No
2	CHLORINE	Cl_2	G	7782-50-5	3	0	0	COR	RM	Above ground	Atm	CYLINDER	649	584.1	MT	Yes	No	No	No
3	SULFURIC ACID	H_2SO_4	L	7664-93-9	3	0	2	COR	RM	Above ground	Atm	TANK	4	150	MT	No	No	No	No
4	SODIUM HYDROXIDE	NaOH	L	1310-73-2	3	0	1	COR	RM	Above ground	Atm	TANK	2	30	KL	No	No	No	No
5	SULFUR DI-OXIDE	SO_2	G	7446-09-5	3	0	2	COR	RM	Above ground	Atm	CYLINDER	242	217.8	MT	Yes	No	No	No

ANNEXURE -35: COPY-HOLDERS

S. No.	Department/ Function	Custodian	Number of Copies
1.	Emergency Control Center	Site Main Controller	Hard Copies
2.	Operations	Operation Head	Soft Copies)
3.	All Plant	Plant Heads	Soft Copies
4.	Engineering Function	Engineering Head	Soft Copies
5.	HSE	HOD- HSE	Hard Copies
6.	Security	Manager- Security	Soft Copies
7.	Quality Assurance/ Quality Control	Manager- QA/QC	Soft Copies
8.	For Distribution to Govt. Offices	……..	…….