

Report of Functional Area Expert For “Risk Assessment & Hazard Management” (RH)

Prepared and submitted by

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Study Period: March-May, 2017

1.0 INTRODUCTION

Project Proponent: Haryana Urban Development Authority

1.1 Name of the Project: Township Project

1.2 Location: Sec 21& 22(Part) Village Khairpur, Vaidwala, Nejadela, District-Sirsa

1.3 Project Category as per EIA Notification: 8 (b) Cat “b”

2.0 Project Identification

PROJECT SITE SURROUNDING INFRASTRUCTURE

Nearby Villages:

- Jhopra Village-1. 30 Km, NW
- Mirpur Village -2.55 Km, SW
- Chattar Garh- 1.8 Km, SW
- Vaidwala Village- 1.91 Km, SE

Schools/Hospitals/ Police Stations

- Jan Nayak Ch. Devi Lal Vidhyapeeth – 0.12 Km, W
- Chaudhary Devi Lal University- 1.9 Km, SW
- Government National Girls College- 3.39 Km, SW
- Rajendra Institutes- 3.83 Km, SE
- Sadar Police Station- 3.75 Km, SW
- Navjeevan Hospital- 4.45 Km,SW

Lakes /Water Body

- Ghaggar River – 4.44 Km, N
- Ottu Lake- 16.99 Km, NW

Nearby Transportation

- Air Force Station- 4.52 Km, NW
- Sirsa Railway Station- 2.26 Km, SW
- Bus Stop Near Barnala Road- 2.11 Km, SW
- Jagdev Singh Chowk Bus Stop- 2.95 Km, SW
- Sirsa Airport 5.83 Km, W

Area Statement of the project

S.No.	Particulars	Area (acres)	Area (m ²)
1.	Total Area of Sector (As Per Outer Boundary)	470.673	1904747.737
2.	Area not Acquired (Subhas Basti, License Granted Colonies, CLU Area of Sirsa School, & Petrol Pump	120.103	486040.0266
3.	Arealeft Out in Section 6	10.16	41116.0976
4.	Area Left Out During The Award (License Colony, Area Already Acquired Existing Shops at Barnala Road, Area of Path Released Land	32.004	129515.7074
5.	Area of Sector As Per Award on Dated 12.1.2011 & 12.6.2013	306.406	1239982.185
6.	Area Released After Award By Hon'ble High Court & Govt.	7.00	28328.02
7.	Net Area Acquired	301.406	1219747.885
8.	Area Under Bypass Road, Sector Road, Sector Road Widening, Green Belt Along Bypass , Sirsa- Barnala Road, & Sector Road	81.20	328605.032
9.	Net Area Planned	220.206	891142.8532
10.	Area Under Residential Plots	67.56	273405.8616
11.	Area Under EWS/ Ashiana Scheme/Housing Board	28.67	116023.4762
12.	Area under Outseen Claims	3.02	12221.5172
13.	Area Under Shopping Center	11.75	47550.605
14.	Area Under Senior Secondary School	5.25	21246.015
15.	Area Under Primary School/ Nursery School	1.47	5948.8842
16.	Area Under Group Housing Sites	1.76	7122.4736
17.	Area Under Post Offices & Telephone Exchange	1.00	4046.86
18.	Area Under Hospital & Nursing Home /Clinic	5.55	22460.073
19.	Area Under Institutional Sites	15.50	62726.33
20.	Area Under Religious Build/ Dharamsala	1.41	5706.0726
21.	Area Under CNG/LPG Pump / Petrol Pump	0.80	3237.488
22.	Area Under Banquet Hall/ Community Center	2.05	8296.063
23.	Area Under Fire Station	1.00	4046.86
24.	Area Under Daycare/ Oldage Home	1.70	6879.662

25.	Area Under Water Works	1.05	4249.203
26.	Area Under Roads, Parks, Open Spaces, Green Belt, Tube well	70.66	285951.1276
27.	Saleable Area	41.63% of acquired area	507781.045

3.0 Risk Assessment

Real estate sector is associated with several hazards that pose impacts on employees & surrounding area necessitating adequate implementation of Safety and health measures. Risk Assessment tool enables to enhance preparedness action to be taken well in advance.

4.0 Hazard Identification (HAZID) :

Residential Plotted Colony encompasses the lives of a large number of people. It also involves installation of various structures and machineries that meet the comfort and needs of its population but may also pose serious threat to the occupants in case of an accident. It is thus considered necessary to carry out a risk assessment and disaster management plan for the project. Major Risks involved in Construction of HUDA Township Project are following:

1. Fall Hazard due to work at height
2. Hazard due to confined space work
3. Occupational Health Hazards
4. Failure of Heavy Machinery during Operation phase.
5. slip
6. Trip
7. Fire
8. Electrical Hazards
9. Natural Hazards
10. Site/slope failure in Excavation work

5.0 Mitigation measures for Identified Hazards:

Table. 1.1
Identified Hazards and their Mitigation Measure

HAZARDS ASSOCIATED WITH ACTIVITIES	CONTROL/MITIGATION MEASURES
(During Construction & Operation)	
Manual Handling	
- Strains and sprains due to incorrect lifting	- Exercise/warm up
- too heavy loads	- get help when needed
- twisting - bending - repetitive movement - body vibration.	- control loads
	- rest breaks/no exhaustion
	- no rapid movement /twisting/ bending / repetitive movement
	- Good housekeeping.
Falls - Slips – Trips	
- Falls on same level	- Good Housekeeping
- falls to surfaces below	- tidy workplace
- poor housekeeping	- guardrails, handholds, harnesses, hole cover, hoarding, no slippery floors/trip hazards
- slippery surfaces	- clear/ safe access to work areas
- uneven surfaces	- egress from work areas
- poor access to work areas	- dust/water controlled
climbing on and off plant	- PPE.
- unloading materials into excavations	
Wind	
- falling objects.	
Fire	
- Flammable liquids/Gases like LPG, Diesel Storage area and combustible building materials	- Combustible/flammable materials properly stored/used
- poor housekeeping	- good housekeeping
- grinding sparks	- fire extinguishers made available & Fire hydrant Network with reserve Fire water (As per NFPA Code)
- open flames, absence of Fire hydrant net work.	- Emergency Plan in case of Fire or collapse of structure.
Absence Of Personal Protective Equipment	
- Lack of adequate footwear	- Head/face
- head protection	- footwear
	- hearing/eye

HAZARDS ASSOCIATED WITH ACTIVITIES	CONTROL/MITIGATION MEASURES
(During Construction & Operation)	
<ul style="list-style-type: none"> - hearing/eye protection - respiratory protection - gloves - goggles. 	<ul style="list-style-type: none"> - skin - respiratory protection provided - training - maintenance
Defective or wrong Hand Tools	
<ul style="list-style-type: none"> - Wrong tool - defective tool - struck by flying debris - caught in or on - missing guards 	<ul style="list-style-type: none"> - Right tool for the job - proper use of tools - good condition/ maintenance guards - isolation/ proper demarcation of work space - eye/face protection - flying debris controlled
Electricity	
<ul style="list-style-type: none"> - Electrocution - overhead/underground services - any leads damaged or poorly insulated - temporary repairs - no testing and tagging - circuits overloaded - non use of protective devices. 	<ul style="list-style-type: none"> - Leads good condition and earthed - no temporary repairs - no exposed wires - good insulation - no overloading - use of protective devices - testing and tagging - no overhead/ underground services
Scaffolding	
<ul style="list-style-type: none"> - Poor foundation - lack of ladder access insufficient planking - lack of guardrails and toe boards - insufficient ties or other means - all scaffolds incorrectly braced or stabilized to prevent overturning. 	<ul style="list-style-type: none"> - All scaffolds correctly braced and stabilized - 3:1 height to base ratio - firm foundation, plumb and level - ladder access provided and used - proper platform (3 planks/675 mm) - planks secured - guardrails and toe boards - 900mm to 1100mm high, within 200mm of Working face, mid-rail.
Ladders	
<ul style="list-style-type: none"> - Carrying loads - not secured against dislodgement - defective ladders - not sufficient length - wrong positions 	<ul style="list-style-type: none"> - Secured against movement or footed - ladders in good condition - regularly inspected - extend 1m above platform - 4:1 angle

HAZARDS ASSOCIATED WITH ACTIVITIES	CONTROL/MITIGATION MEASURES
(During Construction & Operation)	
- incorrectly placed (angles, in access ways, vehicle movements.	- out of access ways, vehicle movements - not carrying loads - 3 points of contact - no higher than 3 rd step down - use for access only, not working platforms
Excavations	
- Trench collapse - material falling in undetected underground services - falls - hazardous atmosphere struck by traffic and mobile plant.	- Soil stability known - no water accumulation - existing services known - material 600mm from edge - clear of suspended loads - hardhats/PPE - ladders - public protection - atmospheric testing - traffic controls - Emergency Plan.
Gas Cutting and Welding	
- Fire - welding flash, burns, fumes, electrocution in wet conditions - flashback in oxygen set, leaking cylinders, acetylene cylinders lying down - poorly maintained leads.	- Welding flash and burns controlled with PPE and shields - fumes controlled with ventilation and PPE (in good condition and properly positioned), Gas cylinders be kept upright & secured position (properly tied) - Combustible materials to be kept at secured place to avoid fire & Fire Extinguishers to be kept in fire prone area with training to people for its use.
Noise	
- Unknown noise levels - known noise levels over 85 decibels	- Levels below 85 decibels - Proper protection.
Falling Material	
- Fall during carrying/Lifting materials- dislodged tools and materials from overhead work areas.	- Materials to be secured - kept away from edge - toe boards - Use of hard hats.

HAZARDS ASSOCIATED WITH	CONTROL/MITIGATION MEASURES
ACTIVITIES	
(During Construction & Operation)	
Craneage & Lifts - Display of carrying capacity i.e. load (No. Of person), incorrectly slung, defective lifting equipment, unsecured loads, craning in close proximity to building people and Plant - falls - falling materials.	
Visitors Presence at site - Falls - struck by dropped materials - road accidents - insufficient hoarding or fencing - pedestrian access past site - mechanical plant movement on and off site.	
	- Periodic testing by competent authority - correctly slung/secured loads, lifting equipment good condition - use of proper hand signals - falls while unloading controlled.
	- Sufficient hoarding - fencing and barricades - safe pedestrian access past site traffic management for loading and delivery - Construction separated from occupied areas of Projects.

Mitigation Measure for LPG Leakage

1. The affected area should be evacuated and cordoned off immediately
2. Initiate an Emergency Response Team for LPG leakage.
3. Shut down the main valves in the gas bank.
4. Ensure that only concerned personnel are present in the affected area and all other personnel and visitors are moved to the nearest assembly points.
5. Rescue trapped personnel, also check if any personnel are unconscious in the area and immediately move them outside and provide first aid. Ambulance should be summoned to take injured personnel to the nearest hospital.
6. Personnel in the nearby buildings to close all doors and windows to prevent entry of the leaked gas.
7. Source of leakage to be traced and isolated from all the other areas. And if required use pedestal fans to bring down the gas concentration.
8. In case of a fire follow the instructions in case of fire.

Mitigation Measure in case of Fire

1. Required response during in the event of a fire should be described in signs located in the lobby.
2. On sighting a fire, it should be immediately informed to the environment manager giving the exact location and type of fire in detail.
3. Initiate the Emergency Response Team for fires.
4. If the fire is small, engage in extinguishing the fire using the nearest fire extinguisher.
5. Guide the Emergency Response Team staff to the emergency assembly point.
6. The Emergency Response Team should immediately inform the nearest dispensary and security force. If required a fire tender should be summoned.
7. The response team should immediately move to the point of fire and take all necessary steps to stop the fire. If the fire is not controllable and spreads then the manager in charge should inform the district authorities and call for external help.
8. The Emergency Response Team will provide immediate relief to the injured residents at the scene of incident. Any injured persons should be evacuated on priority to the dispensary or one of the nearest hospitals based on their condition.

Instructions for occupants

1. Get out of buildings as quickly and as safely as possible.
2. Use the stairs to escape. When evacuating, stay low to the ground.
3. If possible, cover mouth with a cloth to avoid inhaling smoke and gases.
4. Close doors in each room after escaping to delay the spread of the fire.
5. If in a room with a closed door.
6. If smoke is pouring in around the bottom of the door or if it feels hot, keep the door closed.
7. Open a window to escape or for fresh air while awaiting rescue.
8. If there is no smoke at the bottom or top and the door is not hot, then open the door slowly.
9. If there is too much smoke or fire in the hall, slam the door shut.
10. Stay out of damaged buildings.
11. Check that all wiring and utilities are safe.

Recommendation for Fire Fighting Facilities

All the fire extinguisher system will be controlled by the Security Department. Safety department will consist of qualified safety manager, safety officer and supporting staff.

- ✓ Portable fire extinguishers
- ✓ Fire Buckets
- ✓ Fire Hydrants-Hose Reels
- ✓ Smoke detectors
- ✓ Wet Risers,
- ✓ Automatic Sprinkler system
- ✓ Alarm System

Table no 1.2

General Recommendation for Fire Fighting Facilities

Sl No.	Name of site	Type of Extinguisher
1	Cable galleries	CO ₂ Type
2	High voltage panel	CO ₂ & Foam type, Dry chemical powder
3	Control rooms	CO ₂ & Foam type, Dry chemical powder
4	MCC rooms	CO ₂ & Foam type, Dry chemical powder
5	Pump Houses	CO ₂ & Foam type, Dry chemical powder
6	Guest houses and offices	Dry chemical powder, foam type
7	Godowns, Lubrication rooms,	Foam type

Personal Protective Equipment (PPE) used during Construction Phase

Personal Protective equipment's kept onsite are made readily available to plant personnel. **Table1 .3** shows the lists of recommended Personal Protective equipment's (PPE) onsite.

Table 1.3

Summary of Recommended Personal Protective Equipment According to Hazard

	Workplace Hazards	Suggested PPE
Eye and face protection	Flying particles, molten metal, gases or vapors, light radiation	Safety glasses with side-shields, protective shades, etc.
Head protection	Falling objects, inadequate height clearance, and overhead power cords	Plastic helmets for top and side impact protection
Hearing protection	Noise	Hearing protectors (ear plugs or ear muffs)

	Workplace Hazards	Suggested PPE
Foot protection	Failing or rolling objects, points objects. Corrosive or hot liquids	Safety shoes and boots for protection against moving and failing objects, liquids and chemicals
Hand protection	Hazardous materials, cuts or lacerations, vibrations, extreme temperatures	Gloves made of rubber or synthetic material (Neoprene), leather, steel, insulation materials, etc.
Respiratory protection	Dust, fogs, fumes, mists, gases, smokes, vapors	<ul style="list-style-type: none"> ➤ Facemasks with appropriate filters for dust removal and air purification (chemical, mists, vapors and gases). ➤ Single or multi-gas personal monitors, if available
	Oxygen deficiency	Portable or supplied air (fixed lines). Onsite rescue equipment
Body / leg protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration	Insulating clothing, body suits, aprons etc. of appropriate materials
Work at Height	Fall/ slip/ Trip Hazard	Safety Harness, Safety Belt, safety shoes, Jackets, Lanyards, Slings

6.0 Natural Hazards in Sirsa District

The district has been traditionally vulnerable to different disasters on account of its unique geo-climatic condition. The Vulnerability Chart of the district is given below for reference.

Table 1.4
Vulnerability Chart

Sr. No.	Hazards	Likelihood of Occurrence (Indicative, based on data available in Sirsa)											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Flood												
2	Earthquake												
3	Fire												
4	Cold wave												
5	Heat wave												
6	Hail storm												
7	Road Accident												
8	Rail Accident												
9	Air Accident												
<u>Legend:</u>		High				Moderate				Low			

Table 1.5
Risk Analysis based on Vulnerability of the district.

Sr. No.	Hazard Risk Level	Hazard	What/Who is at Risk?
1	High Risk	Earthquake	<ul style="list-style-type: none"> • Human Life, • Cattle life, • Transport • Houses, • Infrastructure • Development Activities • Etc
			<ul style="list-style-type: none"> • Agriculture crops • Transport • Construction Activity • Drinking water
			<ul style="list-style-type: none"> • Cattle & its food • Vulnerable groups • Electricity • Rice Mills • Livelihood • Trees (Plantation) • Vulnerable groups • Etc
			<ul style="list-style-type: none"> • Human life • Cattle • Houses & property • Crops • Malls
2	Moderate Risk		<ul style="list-style-type: none"> • Human Life • Cattle life • Small Animals • Crops • Trees • Livelihood • Vulnerable groups
			<ul style="list-style-type: none"> • Human life • Cattle life • Trees (Plantation)

Sr. No.	Hazard Risk Level	Hazard	What/Who is at Risk?
			<ul style="list-style-type: none"> Electricity Supply Houses School & colleges
3	Low Risk		<ul style="list-style-type: none"> Crops Cattle Small Animals Thatched Houses
			<ul style="list-style-type: none"> Human Life Transport network

A. Earthquake

Earthquakes may cause a number of phenomena, including ground motion, surface faulting, ground failure, and liquefaction. An earthquake's magnitude reflects an earthquake's strength. Damage to buildings generally begins to occur at magnitude six, while an earthquake above magnitude seven may be a major disaster if it occurs near a populated area. Above a map prepared by Bureau of Material and Technology Promotion Council and printed in Vulnerability Atlas -2nd Edition indicates that Panipat district falls in seismic zone III & IV which, is considered to be facing highest danger of earthquakes in India after the Zone-V. This makes the area liable to MSK intensity of –VIII.

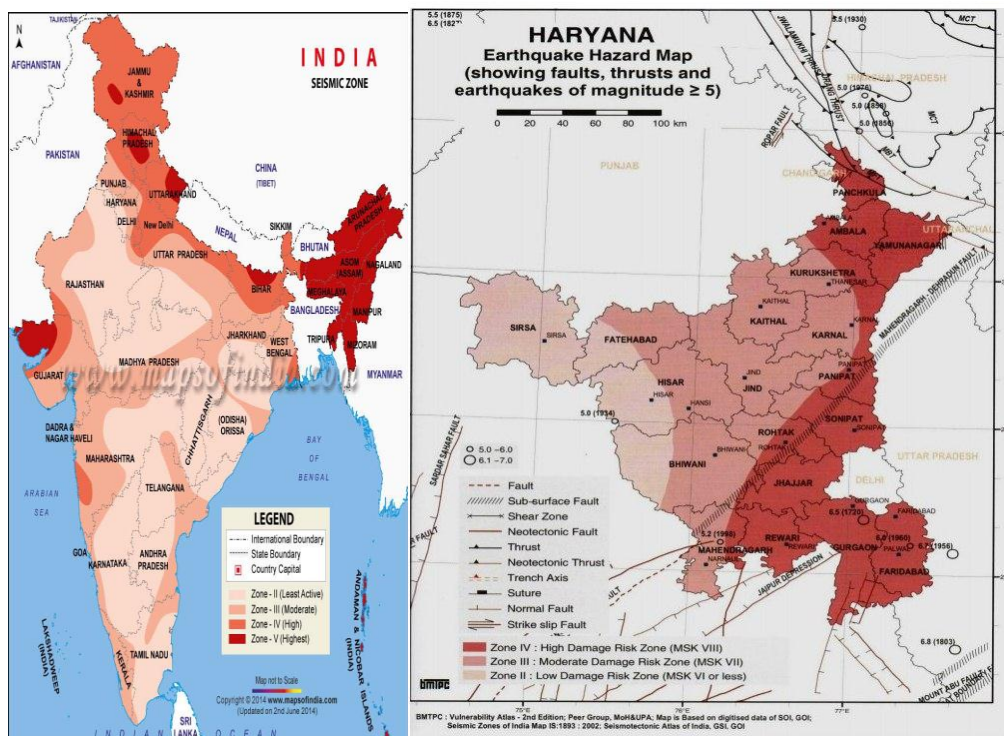


Fig No: 1.1. Earth Quake Zonation Map

Emergency recovery plan has been considered by the emergency management team as per the situation and site conditions as follows in **Table No 1.6**. Earthquakes usually give no warning at all. Consider following in Pre & Post Disaster Phases

Before the earthquake:

- ✓ Always keep the following in a designated place: bottled drinking water, nonperishable food, and first-aid kit, torch-light and battery-operated radio with extra batteries.
- ✓ Teach family members how to turn off electricity, gas, etc.
- ✓ Identify places in the house that can provide cover during an earthquake.
- ✓ It may be easier to make long distance calls during an earthquake.
- ✓ Identify an out-of town relative or friend as your family's emergency contact. If the family members get separated after the earthquake and are not able to contact each other, they should contact the designated relative/friend. The address and phone number of the contact person/relative should be with all the family members.
- ✓ Safeguard your house
- ✓ Consider retrofitting your house with earthquake-safety measures \Reinforcing the foundation and frame could make your house quake resistant. You may consult a reputable contractor and follow building codes.
- ✓ Kutcha buildings can also be retrofitted and strengthened.

During quake:

- ✓ Earthquakes give no warning at all. Sometimes, a loud rumbling sound might signal its arrival a few seconds ahead of time. Those few seconds could give you a chance to move to a safer location. Here are some tips for keeping safe during a quake.
- ✓ Take cover. Go under a table or other sturdy furniture; kneel, sit, or stay close to the floor. Hold on to furniture legs for balance. Be prepared to move if your cover moves.
- ✓ If no sturdy cover is nearby, kneel or sit close to the floor next to a structurally sound interior wall. Place your hands on the floor for balance.
- ✓ Do not stand in doorways. Violent motion could cause doors to slam and cause serious injuries. You may also be hit by flying objects.
- ✓ Move away from windows, mirrors, bookcases and other unsecured heavy objects.
- ✓ If you are in bed, stay there and cover yourself with pillows and blankets
- ✓ Do not run outside if you are inside. Never use the lift.
- ✓ If you are living in a kutcha house, the best thing to do is to move to an open area where there are no trees, electric or telephone wires.

If outdoors:

- ✓ Move into the open, away from buildings, streetlights, and utility wires. Once in the open, stay there until the shaking stops.
- ✓ If your home is badly damaged, you will have to leave. Collect water, food, medicine, other essential items and important documents before leaving.
- ✓ Avoid places where there are loose electrical wires and do not touch metal objects that are in touch with the loose wires.
- ✓ Do not re-enter damaged buildings and stay away from badly damaged structures.

If in a moving vehicle:

- ✓ Move to a clear area away from buildings, trees, overpasses, or utility wires, stop, and stay in the vehicle. Once the shaking has stopped, proceed with caution.
- ✓ Avoid bridges or ramps that might have been damaged by the quake.

After the quake:

- ✓ Here are a few things to keep in mind after an earthquake. The caution you display in the aftermath can be essential for your personal safety.
- ✓ Wear shoes/chappals to protect your feet from debris
- ✓ After the first tremor, be prepared for aftershocks. Though less intense, aftershocks cause additional damages and may bring down weakened structures. Aftershocks can occur in the first hours, days, weeks, or even months after the quake.
- ✓ Check for fire hazards and use torchlight's instead of candles or lanterns.
- ✓ If the building you live in is in a good shape after the earthquake, stay inside and listen for radio advises. If you are not certain about the damage to your building, evacuate carefully. Do not touch downed power line.
- ✓ Help injured or trapped persons. Give first aid where appropriate. Do not move seriously injured persons unless they are in immediate danger of further injury. In such cases, call for help.
- ✓ Remember to help your neighbours who may require special assistance-infants, the elderly, and people with disabilities.
- ✓ Listen to a battery-operated radio for the latest emergency information.
- ✓ Stay out of damaged buildings.
- ✓ Return home only when authorities say it is safe. Clean up spilled medicines, bleaches or gasoline or other flammable liquids immediately. Leave the area if you smell gas or fumes from other chemicals. Open closet and cupboard doors cautiously.

- ✓ if you smell gas or hear hissing noise, open windows and quickly leave the building.
- ✓ Turn off the switch on the top of the gas cylinder.
- ✓ Look for electrical system damages - if you see sparks, broken wires, or if you smell burning of amber, turn off electricity at the main fuse box. If you have to step in water to get to the fuse box, call an electrician first for advice.
- ✓ Check for sewage and water lines damage. If you suspect sewage lines are damaged, avoid using the toilets. If water pipes are damaged, avoid using water from the tap.
- ✓ Use the telephone only for emergency calls.
- ✓ In case family members are separated from one another during an earthquake (a real possibility during the day when adults are at work and children are at school), develop a plan for reuniting after the disaster. Ask an out of state / district relative or friend to serve as the “family contact”. Make sure everyone in the family knows the name, address, and phone number(s) of the contact person (s).

Table No 1.6

Emergency Preparedness for Earthquake

Step	Activity	Action By
Preparedness	<ul style="list-style-type: none"> • Constitute Emergency Response Team • Identify ECC, if the identified ones are damaged • Control centers to be equipped with <ul style="list-style-type: none"> ❖ Alarming ❖ Communication facilities ❖ Emergency vehicles/ equipment ❖ List of emergency contacts & suppliers ❖ Medical facilities 	Plant Key Person
Action during effective period	<ul style="list-style-type: none"> • Do not panic. Raise alarm • Avoid standing near to windows, external walls • Stand near the columns or duck under sturdy furniture. • Assemble at emergency assembly point as there may be aftershocks 	Individual(s)
Action after effective Period (Establish Emergency Control Center. Site Main Controller to	<ul style="list-style-type: none"> • Assess situation and initiate shut down of plants (if required) • Initiate search & rescue (if required) • Evacuation of people. • Recovery/ Rehabilitation Work • Medical care for the injured. • Supply of food and drinking water. • Temporary shelters like tents, metal sheds etc. 	Main Controller, Incident Controller, Site Incident Controller, , Coordinators – Fire & Security, Safety, Material and Medical

direct all activities)	<ul style="list-style-type: none"> • Repairing lines of communication and information. • Restoring transport routes • Take head count • Activate emergency plan as situation demands • Assess damage 	
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B. Floods

The Ghaggar River in Haryana-Punjab plains, northern India presents a challenge in terms of repeated flash flood hazard. Despite a long history of flood management in the basin for more than 2 decades, the river continues to be a cause of concern owing to extensive flooding. Apart from the proximity to high slope of upper catchment area, the disturbance of natural drainage channels due to human intervention is also identified as one of the main factors increasing Sirsa's vulnerability to the flood hazard. Annual peak discharges often exceed the mean annual flood and the low-lying areas of the alluvial plains are extensively inundated year after year.

Flooding occurs in the Middle and lower Ghaggar river basins in Haryana and Punjab region almost every year with variation in extent, but the problem is seen to be getting worse with each consecutive flood. These floods cause loss of lives, damages to public and private properties and destruction of normal cultivating cycle. According to a report produced by the Disaster Management Division, Ministry of Home Affairs, due to the flooding that occurred in July 2010 in Haryana, over 4 lakh people from over 600 villages (mostly from Ambala, Kurukshetra, Sirsa, Fatehabad and Sirsa) were affected. Nearly 3 lakh hectares of agricultural land were inundated with flood water At least 51 persons died due to the severe flooding.

Major impact of flooding has been observed in the middle and lower parts of the Ghaggar River Basin, at the foot of the steep slopes of the Shivalik Hills in the Himalayas. This situation, combined with the heavy rainfalls common in the areas along the Ghaggar River results in this area being frequently affected by flash floods of the Ghaggar, Markanda, Tangri and a few other small watercourses. Human activities like agricultural practice, construction of settlements, construction of roads with inadequate culvert and, most importantly, of poorly designed drains and canals have changed the morphology of the natural drainage system of plains and palaeo-channels. These changes have also accelerated the occurrence of floods. In general, encroachments in the form of unsustainable land uses and development practices may often make a sizeable contribution to increase risk and vulnerability to floods. Ideally, the natural drains should have been widened (similar to road widening for increased traffic) to accommodate the higher flows of storm water. But on the contrary, there have been large scale encroachments on the natural drains and the river flood plains.

Villages Critically Affected by Flooding in District Sirsa

A list of critically affected villages which have been vulnerable to flooding due to proximity to the Ghaggar river is as follows:

Table 1.7
List of Critically affected villages due to flood

i.	Nezadela kalan and khurd
ii.	Farwain khurd/Kalan
iii.	Dharampura
iv.	Burj karamgarh
v.	Ranjitpur Thedi
vi.	Panihari
vii.	Mattar
viii.	Lahengewala
ix.	Kirarkot
x.	Budhabhana
xi.	Mallewala
xii.	Saharni
xiii.	Musahibwala
xiv.	Jhopra
xv.	Nezadela Khurd
xvi.	Ranga
xvii.	Nagoki
xviii.	Ottu
xix.	Ferozabad
xx.	Nakora
xxi.	Nagrana
xxii.	Thedi Mohar Singh
xxiii.	Harni Khurd
xxiv.	Jiwan Nagar
xxv.	Sant Nagar
xxvi.	Dhani Santa Singh
xxvii.	Shekhupura
xxviii.	Hamayukhera
xxix.	Abholi
xxx.	Dhani Sangatpura
xxxi.	Dhanoor
xxxii.	Dhani satnam Singh
xxxiii.	Kariwala
xxxiv.	Bani



Fig No: 1.2. Flood Zonation Map

C. Storm

The contingency actions during storm shall be based on the weather forecasts obtained from meteorological stations and the local meteorological department. Some of the important actions to be carried out are as follows:

Prior to Storm

- ✓ Communication with the local meteorological department.
- ✓ Maintain distances from storm in order to execute preparatory actions in a shorter time.
- ✓ Considering the consequences about the emergency might have on operations and personnel.
- ✓ Review all operations carefully to ensure that systems in jeopardy are taken care of or shut down.
- ✓ Ensure the readiness of first aiders, emergency vehicles, medical centre, medicines etc.
- ✓ Metallic sheets, loose materials, empty drums and other light objects shall be properly secured.
- ✓ Flush the drainage systems.

During Storm

- ✓ Remain calm.
- ✓ Avoid going outdoors.
- ✓ Do not seal the office completely as the suction created by the difference in atmospheric pressure inside and outside can rip open a window or door by breaking window glass panes.

After the Storm

- ✓ Do not touch electric lines.
- ✓ Stay away from the disaster area.
- ✓ Take special precautions in driving vehicles since the under-pavement could cave in due to the weight of automobile.

Hail Storm

Hailstorms are a common phenomenon in Sirsa district. They occur during winters and sometimes during freak weather incidences that lower the temperature in the district. Hailstorms, while they are temporary and do not last for too long a time, can cause immense damage to crops in fields, leading to huge losses for farmers.

D. Fire

Fires are far more common in rural areas than in the urban ones. The fires are mostly caused by electric short-circuiting and they spread due to dried leaves. Cattle are also at risk of being injured or killed in fires that might break out in rural areas where the animals are tethered, due to their feed (dry hay) catching fire. Further details of fires in Sirsa district are available with the SK branch in the Mini-Secretariat building, Sirsa.

E. Extreme temperatures in District

Hailstorms, Thunderstorm, Dust storm & Fog April to June is the period with the highest incidence of thunderstorms and dust storms. Violet squalls (Andhis) often accompany such storms. Some of the thunderstorms do not give any appreciable rain, but others often accompanied with heavy rain and occasional hail. Thunderstorms also occur in the winter months in association with passing western disturbances. Fogs sometimes dense occur in the cold season.

a. Heat Wave

Heat wave is experienced in the Sirsa district as the summers are extremely hot with temperatures around 40-45 degrees Celsius accompanied with hot, dry winds.

b. Cold Wave

Cold waves have a moderate/high probability of occurrence in the Sirsa district. During December and January, the average minimum temperature is recorded around 3-4°C which, at times, reaches as low as 0°C. The cold wave is generally associated with Frost which is one of the reasons for huge crop losses in the District.

6.0 DISASTER MANAGEMENT PLAN

6.1 INTRODUCTION TO THE TERM “DISASTER”

The term “Disaster” refer to extensive damage of property and serious disruption both inside, outside the work system and its surrounding that can be natural or human interfered. Emergency may be caused by a number of different factors, e.g. plant failure it will normally manifest itself in three basic forms viz fire, explosion or toxic release and requires the assistance of emergency control services to handle mass devastation effectively.

6.2 NEED OF DISASTER MANAGEMENT

The aim of Disaster management plan is concerned with preventing accidents through following guidelines of good design practice, operation, maintenance and inspection, by which it is possible to reduce the risk of an accident. Since it is known to all it is not possible to eliminate entire risk since, absolute safety is not achievable.

After Assessing and quantifying the possible scenarios, consequence analysis approach to emergency preparedness and emergency planning delineates Disaster Management Plan for both on-site and off-site. These plans are needed to be implemented in the event of a disaster.

6.3 Emergency planning and Response procedure

The Emergency Response Plan is plan for dealing with emergencies are implemented immediately whenever there is a fire, explosion, or release of a hazardous substance that threatens human health or the environment. The emergency response plan is reviewed and immediately amended whenever:

- ✓ The plan fails in an emergency
- ✓ The list of emergency contacts change
- ✓ The list of emergency equipment changes
- ✓ The facility changes in its design, construction, operation, maintenance, or other circumstances in a way that increases the potential for fire, explosions, or release of a hazardous substance

6.3.1 Incident Response Plan

It is the Frame work of addressing the emergency situation arose due to failure scenario.

- ✓ Incident Response Plan(IRP) and Emergency Preparedness Plan
- ✓ Incident Response Team (IRT)
- ✓ Emergency Response Team (ERT)
- ✓ Crisis Management Team (CMT)

6.4 Onsite Disaster Management Plan

Disaster management plan are prepared with an aim of taking precautionary step to control the hazard propagation, avert disaster, take action after the disaster which limits the damage to the minimum and follow the on-site emergency planning.

6.4.1 Onsite Emergency Plans

The onsite emergency is an unpleasant situation that causes extensive damage to plant personnel and surrounding area and its environment due to in operation, maintenance, design and human error. Onsite plan will be applied in case of new Project activity. Following point are taken into consideration:

- ✓ To identify, assess, foresee and work out various kinds of possible hazards, their places, potential and damaging capacity and area in case of above happenings.
- ✓ Review, revise, redesign, replace or reconstruct the process, plant, vessels and control measures if so assessed.
- ✓ Measures to protect persons and property of Construction mahinery in case of all kinds of accidents, emergencies and disasters
- ✓ To inform people and surroundings about emergency if it is likely to adversely affect them

6.5 Off-Site Emergency Planning

The off-site emergency plan is an integral part of any hazard control system. It is based on those accidents identified by the works management, which could affect people and the environment outside the works. Thus, the off-site plan follows logically from the analysis that took place to provide the basis for the on-site plan and the two plans therefore complement each other. The roles of the various parties that may be involved in the implementation of an off-site plan are described below. The responsibility for the off-site plan will be likely to rest either with the works management or with the local authority. Either way, the plan must identify an emergency coordinating officer who would take overall command of the off-site activities. Consideration of evacuation may include the following factors:

- ✓ In the case of a major fire but without explosion risk (e.g. an oil storage tank), only houses close to the fire are likely to need evacuation
- ✓ If fire is escalating very fast it is necessary to evacuate people nearby as soon as possible
- ✓ In acute emergency people are advised to stay indoors and shield themselves from the fire.

6.5.1 Organization

Organizational details of command structure, warning systems, implementation procedures, emergency control centres include name and appointments of incident controller, site main controller, their deputies and other key personnel involved during emergency.

6.5.2 Communications

Identification of personnel involved, communication centre, call signs, network, list of telephone numbers.

6.5.3 Special Emergency Equipment

Details of availability and location of heavy lifting gear, specified fire-fighting equipment, fireboats etc.

6.5.4 Voluntary Organizations

Details of Voluntary organizations, telephone numbers nearby of hospitals, Emergency helpline, resources etc are to be available with chief authorities.

6.5.5 Non-governmental Organizations (NGO)

NGO's could provide a valuable source of expertise and information to support emergency response efforts. Members of NGOs could assist response personnel by performing specified tasks, as planned during the emergency planning process.

- ✓ Evacuation of personnel from the affected area
- ✓ Arrangements at rallying posts and parking yards
- ✓ Rehabilitation of evacuated persons

6.5.6 Chemical information

Details of the hazardous substances (MSDS information) and a summary of the risks associated with them will be made available at respective site.

6.5.7 Meteorological information

There is to be arrangements for obtaining details of weather conditions prevailing at r before the time of accident and weather forecasts updates.

6.5.8 Humanitarian Arrangements

Transport, evacuation centres, emergency feeding, treatment of injured, first aid, ambulances, temporary mortuaries.

6.5.9 Public Information

- ✓ Dealing with the media-press office
- ✓ Informing relatives, etc.

6.5.10 Assessment

- ✓ Collecting information on the causes of the emergency
- ✓ Reviewing the efficiency and effectiveness of all aspects of the emergency plan.

6.5.11 Role of local authority

Local Authorities like Panchayat, Sabha, Samity, municipalities can help in combating emergency situation after assessing the impact scenario in rescue phase.

6.5.12 Role of police

The police is to assist in controlling of the accident site, organizing evacuation and removing of any seriously injured people to hospitals.

- ✓ Co-ordination with the transport authorities, civil defence and home guards
- ✓ Co-ordination with army, navy, air force and state fire services
- ✓ Arrange for post mortem of dead bodies
- ✓ Establish communication centre with easy contact with ECC

6.5.13 Role of Fire Brigade

The fire brigade shall be organized to put out fires and provide assistance as required during emergency.

6.5.14 Media

- ✓ The media is to have ready and continuous access to designated officials with relevant information, as well as to other sources in order to provide essential and accurate information to public throughout the emergency and to avoid commotion and confusion
- ✓ Efforts are made to check the clarity and reliability of information as it becomes available, and before it is communicated to public
- ✓ Public health authorities are consulted when issuing statements to the media concerning health aspects of chemical accidents
- ✓ Members of the media are to facilitate response efforts by providing means for informing the public with credible information about accidents involving hazardous substances

6.5.15 Role of health care authorities

- ✓ Hospitals and doctors shall be ready to treat all type of injuries to casualties during emergency.
- ✓ Co-ordinate the activities of Primary Health Centres and Municipal Dispensaries to ensure required quantities of drugs and equipment's
- ✓ Securing assistance of medical and paramedical personnel from nearby hospitals/institutions
- ✓ Temporary mortuary and identification of dead bodies

6.6 Emergency Contact No of Statutory Bodies/ District/Local Bodies.

Table 1.8
List of Emergency Contact No of Sirsa District

Officer/Designation	Phone (Off)	Phone (Resi)
DC, Sirsa	248890	248870, 248880
ADC, Sirsa	247235, 247245	247810, 247976
SP, Sirsa	247212	247400
Sessions Judge	247027	247227
SDM, Sirsa	247345	247445
SDM, Ellenabad - 01698	220287	220288
SDM, Dabwali - 01668	222997	230708
CTM,Sirsa	248881	247645
EO, HUDA	247135	247445
DFO, Sirsa	243307	243114
DRO	248882	247300
RTA	244025	
DD&PO, Sirsa	248883	247317
DIO, NIC	247273	
Civil Surgeon	240155	240669
DETC, Sirsa	247621	247128
DETC (E)	247164	
DFSC, Sirsa	248422	247722
Treasury Officer	247253	
GM,DIC, Sirsa	247650	
GM, Roadways	221274	247384
SE,Public Health	247100	235601
SE,DHVCN	238400	238401
SE, Irrigation	235806	235805
Xen. Panchayati Raj	247479	
Xen. Marketing Board	240743	221559
Distt. Sports Officer	242652	
Distt. Statistical Officer	248204	
DEO, Sirsa	247538	

DEEO	247899	
DIPRO, Sirsa	247201	247246
Distt. Employment Officer	247443	247837
DM,HAFED	240856	240174
GM, Milk Plant	245061	247064
DDA, Sirsa	220371	221683
MD,Coop.Bank	242258	220413
DD,ICDP, Sirsa	245007	
LBO,PNB	221989	
Distt. Attorney	247101	
PO,ICDS	247439	223929
DWO	248891	
DSWO	247610	
DCWO	222602	248222
D.T.P.	247068	247168
Supdt Distt. Jail	247685	247885
Tehsildar Election	248886	
Distt Ayurvedic Officer	243868	247200
Tehsildars		
Tehsildar, Sirsa (01666)	247130	247707
Tehsildar, Rania (01698)	250279	
Tehsildar, Dab. (01668)	230035	224119
Tehsildar, E/bad (01698)	220289	
BD&Pos		
BD&PO, Sirsa (01666)	220483	
BD&PO, Dabwali (01668)	231153	229600
BD&PO Ellenabad (01698)	220063	
BD&PO, Odhan (01696)	251247	
BD&PO Baragudha(01696)	245230	
BD&PO, Rania (01698)	250326	
BD&PO, Nathusari (01666)	256153	
XENs		
PWD(B&R) Divn.I	220530	220442
PWD(B&R) Divn.II	222959	222959
P.H. Divn.I	221750	220561

P.H. Divn.II	221925	229862
P.H. Divn.III		
Xen. Sirsa Divn.	234613	234349
Nehrana Divn.	235259	235434
Rori Divn.	235426	235747
Ghaggar Divn.	235721	234770
DHBVN City Divn.	238405	238406
DHBVN,S/U Divn.	238403	238435
XEN CADA	244129	
SDE NH, Sirsa	220530 PP	
MC, Sirsa	220525, 220939	220324
MC, Dabwali	222623, 222732	
MC Ellenabad	220352	
MC, Rania	250026	
MC, Kalanwali	222016	
Mkt.Comm. Sirsa	220613	220419
Mkt.Comm.E/bad	220042	222132
Mkt.Comm.Rania	250317	
Mkt.Comm.K/wali	222018	
Mkt.Comm.Ding	254247	229022

Table 1.9
Emergency contact No
List of DCs Haryana

Sl No.	District	Office /fax No	Residence	Mobile
1	Ambala	2530100 2535800	2552200 2552201	8059444001
2	Yamunanagar	237800 237801 FAX-220122	237850	9416023768
3	Kurukshetra	220270 FAX-220935	220271	9466300663
4	Kathal	234208	224240	9671722100
5	Hisar	232045	253444/253888	9416545444
6	Sirsa	248890 Fax- 248770/248880	01666-248870	9416025002
7	Jind	01681-246820 01681-246822	24252/246818	8053353000
8	Bhlwani	01664-243535 FAX-242172	243333	8295666888
9	Rohtak	250252-268255 FAX-245533	245588	9467869888

Sl No.	District	Office /fax No	Residence	Mobile
10	Sonipat	0130-2220500	2221500 2221255	9466120007
11	Karnal	2267500	225400	8295090009
12	Panipat	0180-2651502 2653800	2652800	8295602222
13	Jhajjar	252448	255200/252446	9416006665
14	Gurgaon	0124-2325500 FAX-2320508	2303333	9999810000
15	Mewat	01267-246610	274600 2746601	8059794444
16	Faridabad	0129-2226604 FAX-2227936	2226262	9582455555
17	Mahindergah	01282-251201 FAX-251221	251200	8607442004
18	Rewari	01274-225368	225246	9999015551
19	Panchkula	256813	2585666	

Sl No.	District	Office /fax No	Residence	Mobile
			2585777	
20	Fatehabad	01667-23001 /230002	230003/230004	9467445599
21	palwal	248900/248910 FAX-248911	248901	999654900

Details of SSP/SP's of District Haryana

S.No	Name	District	Mobile	Office No	Residential No	Fax No
1	SP, Karnal		9729990700	0184-2267700	2261400 2261500	4091052 4091000
2	SP, Commando KNI		9729990700	0184-2267700 0184-4091002	2261400 2261500	4091052 4091000
3	SP, Kaithal		9729990002	01746-234222	645112	234223(CR) 582100
4	SP, Yamuna Nagar		9729990700	01732-200203	2261400 2261500	231305 237010
5	SP, Kurukshetra		8814090100	01744-220320	220345	220345 228000 222110

S.No	Name District	Mobile	Office No	Residential No	Fax No
6	SP, Rohtak	9996781001	01262-228114	228100	247200
				228101	228145
7	SP/PTC Sunaria	8814000400			
8	SP, Sonipat	8813900800	130-2222907	2222901	2222903(CR)
				2222901	
9	SP, Jhajhar	8930500600	01251-153200	252049	252049
					254212
10	SP, Panipat	8398000601	0180-2699100	2699101	2699141
11	SP, Hisar	9999981805	01662-232307	1662-232306	
12	SP, Bhiwani	8814011400	01664-242700	243777	200203
13	SP, Sisra	8901140000	01666-247212		
14	SP, Fatehabad	8814011700	01667-230005	230006	
				230340	
15	SP, Jind	8930900200	01681-245285	245284	
16	SP/ SVB/ Hisar	09991700391	01662-275280		

S.No	Name District	Mobile	Office No	Residential No	Fax No
		09416300904			
17	SP, Rewari	9416900400	01274-222790	2540115	
18	SP, Mewat	8930900200	01267-274616		271350
19	SP, Mahendergarh at Narnaul	8398000601	01282-251022		
20	SP, Palwal	08930202007	01275-246700	246800	
21	SP, Gurgaon.	9999981802	2222166 2223292	2223025 2573659	

Table 1.10

List of Fire Station Officer District wise Haryana

S.No.	Name of District	Name of Fire Station	Name of Officers & Contact No.	Designation	Landline No.
1	AMBALA	Ambala Cantt	Mr. Ramesh Sihag.	FSO	0171-2630299, 09416401424
2	PANCHKULA	Panchkula	Mr. Shamsher Singh 9780932839	FSO	0172-2579875
3	YAMUNA NAGAR	Yamuna Nagar	Mr. Gulshan Kalra 9416465794	FSO	01732-250101
4	KURUKSHETRA	Kurukshetra	Mr. Krishan 9416412584	FSO	01744-220601

S.No.	Name of District	Name of Fire Station	Name of Officers & Contact No.	Designation	Landline No.
5	KAITHAL	Kaithal	Mr. Jai Bhagwan Sharma	FSO	01746-224211, 224041
6	ROHTAK	Rohtak	Vacant, Addl Charge to Mr. Rajender Dahiya 9416319997	FSO	01262-250488
7	KARNAL	Karnal	Vacant, Addl Charge to Mr. Krishan	FSO, KKR	0184-2270799
8	PANIPAT	Panipat Main	Mr. Hari Singh Saini, 09466045293	FSO	0180-2650458, 2630101
9	SONIPAT	Sonipat	Mr. Satyawar Narwal, 09416564224	FSO	0130-2242889, 2240101
10	JHAJJAR			Vacant	01251-257213
11	BAHADURGARH	Bahadurgarh Main	Mr. Rajender Dahiya 9416319997	FSO	230,500,203,101
12	GURGAON	Gurgaon Sector-29	Mr. I.S. Kashyap 9990417000	FSO	0124-2392201 0124-2392101, 102, 103
		Gurgaon Sector-37	Mr. Birbal Sharma 9899846935	FSO	0124-2373101, 102
		Gurgaon Udyog Vihar	Vacant	FSO	0124-2342101, 2397102
		Bhim Nagar	Vacant		
	Training Centre	Sector-37	Sh. R.D. Bhardwaj	FSO	9466844693
13	FARIDABAD	Faridabad NIT	Mr. D.K. Nanda 9416224734	FSO	0129-2412666
		Faridabad Sector-15	Vacant	FSO	0129-2284444
		Faridabad Sector-31	Sh. Ashok Kumar 9416833887	FSO	0129-2275886
		Ballabgarh	Mr. Satyavan	FSO	0129-2309744

S.No.	Name of District	Name of Fire Station	Name of Officers & Contact No.	Designation	Landline No.
			Samriwal		09466121061, 08826995001
14	PALWAL	Palwal	Sh. Ramdutt Bhardwaj, 09466844693		01275-252101
15	MEWAT	Nuh	Vacant		01267-274703
16	REWARI	Rewari	Mr. Balwant 9416591088	FSO	01274-225111
7	NARNAUL	Narnaul	Vacant Addl Charge to Mr. Balwant Singh	FSO, Hisar	01282-252102
18	HISAR	Hisar Main	Mr. Sajjan Singh Sangwan 9416374373	FSO	01662-257050
19		Hansi	Vacant Addl Charge to Mr. Sajjan Sangwan	FSO, Hisar	01663-254010
20	JIND	Jind	Vacant Addl. Charge to Mr. Jai Bhagwan	FSO, Kaithal	
21	FATEHABAD	Fatehabad	Sh. M.S. Bhardwaj, 09717693921, 09416139399	FSO	01667-220100
22	SIRSA	Sirsa	Mr. Jagdish Gill 9416642237	FSO	01666-220101, 241140
23		Dabwali	Mr. Amar Singh	FSO	735765379 6 01668-223719
24	BHIWANI	Bhiwani	Vacant Addl. Charge to Mr. Tara Chand	SO, Charkhi Dadri	01664-242111, 09812884430

7.0 Occupational Health and Safety during Construction Phase

7.1 The Occupational Health Surveillance Programme:

A team of qualified doctors and nurses will visit periodically for health check up of all the workers, team and its record will be maintained properly.

7.2 Impact on Human Health

This project will have an impact on the human health due to sand/bajri , increased dust, creation of breeding grounds for disease vectors, population influx which might introduce new diseases in the area, and inadequate sanitation facilities may result in severe health Impact. Following measures can be taken to eradicate Impact of the project

7.3 Implementation of Occupational Health and Safety Measures

Occupational Health & Safety measures result in improving the conditions under which workers are employed and work. It improves not only their physical efficiency, but also provides protection to their life and limb. Management will consider the following safety measures:

- Safety clauses in contract order
- Dedicated safety team
- Inspection and maintenance of equipment's and accessories
- Pre placement and periodic health check up
- Removal of unsafe conditions and prevention of unsafe acts
- Detailed analysis of each and every incident
- To provide standard PPEs and ensure its uses for mining safety
- Periodic inspection by internal and external safety experts
- Celebrations of various safety events for awareness
- Medical facilities & first aid boxes will be established in the mine premises.

- Pits, Sumps, openings in floor etc. which may be a source of danger, will be either securely covered or securely fenced. Securely fencing a pit means covering or fencing it in such a way that it ceases to be a source of danger.
- Health Awareness Programmes and camps will be organized
- The mine workers will be provided all necessary PPE, especially dust masks for their safe guard from dust, Ear Plugs/Ear Muffs for noise, boots etc. and measures for other hazards.
- Under initial vocational training, the workers will be given training related to all safety and health aspects.

8.0 Conclusion

Development Activity for Township Project does involve hazardous scenario with risk of worker and Employees during Construction phase. Appropriate safety measure to carry out work safely will be implemented. Administrative and Supervisory control will be implemented. Management procedures like Permit to work, Mock drills, Training & Skill development etc will be taken care off.

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