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LIQUIFIED NATURAL GAS (LNG) EMERGENCY RESPONSE PLAN

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1 EMERGENCY RESPONSE PLAN

This Clean Energy Emergency Response Plan (ERP) has been prepared to establish the procedures for responding to specific emergencies that may occur at one of our Clean Energy owned or operated LNG sites. Copies of these plans are maintained at the Clean Energy corporate office, and at each LNG site. This ERP has been prepared in accordance with:

- Chapter 6.95 of the Health & Safety Code Section 25504 (b)
- Title 19 of the California Code of Regulations, Section 2729-2732
- SARA Title III
- Title 29 Code of Federal Regulations
- Title 49 Code of Federal Regulations
- Title 40 Code of Federal Regulations

The Emergency Response Plan includes protocols to ensure close coordination with local area emergency response organizations, agencies and also with existing state and local Emergency Preparedness Plans. In the event there is a conflict within the standards or regulations or within pre-established site safety guidelines, the more stringent shall govern.

1.1 APPLICABLE CODE AND STANDARDS FOR LNG STATIONS

- International Building Code 2006
- International Fire Code 2006
- International Mechanical Code 2006
- National Electric Code 2011
- International Fuel Gas Code 2006
- NFPA Standards referenced from 2006 IBC Chapter 35 and IFC Chapter 45
- NFPA 52 Vehicular Systems Code 2010, 2013
- NFPA 59A Storage of LNG 2009, 2013
- NFPA 70 National Electric Code (NEC) 2010
- NFPA 79 Electrical standard for mechanical equipment 2010
- TXRR Title 16, Chapter 13 Part 1

1.2 LNG TRANSPORT INFORMATION

- **Shipping Description:** Methane, refrigerated liquid
- **Hazard Class:** 2.1
- **DOT Identification Number:** UN1972
- **DOT Shipping Label:** Flammable Gas
- **Proper Ship Name:** Methane, refrigerated liquid

2 BACKGROUND

2.1 WHAT IS LNG?

LNG is natural gas in a liquid form. The natural gas is cooled to minus 259 degrees Fahrenheit (-162 degrees Celsius), where it becomes a clear, colorless, odorless liquid. LNG is neither corrosive nor toxic. It is made up of mostly methane, with low concentrations of other compounds such as heavier hydrocarbons and nitrogen. During the process known as liquefaction, many compounds found in utility pipeline natural gas are removed, including water, sulfurous compounds including mercaptan (thiol), and carbon dioxide.

2.2 IS LNG TOXIC?

Natural gas is the cleanest burning fossil fuel and is used throughout the world to reduce undesirable emissions. It is odorless, non-toxic and non-corrosive. When LNG is exposed to the environment or spilled, it will rapidly and completely evaporate leaving no residue in water or soil. The only health risks associated with LNG are cold burns, and asphyxiation from the displacement of oxygen.

2.3 HOW IS LNG STORED?

When it is received, it is transferred to insulated storage tanks built specifically for cryogenic temperature fluids. The tanks keep the liquid at low temperatures to minimize evaporation. LNG storage tanks consist of two concentric shells. Vacuum is applied between the shells to reduce convective heat transfer. The inner shell which comes into contact with the cryogenic liquid is made of alloy steel, and is designed to meet the operating pressures and temperatures of the application. The outer shell is made of carbon steel, and is designed to provide structural rigidity and resist the forces of vacuum being applied between the two shells. The space between the shells is filled with a mechanical insulator such as perlite to further reduce heat transfer.

2.4 CAN LNG SPILLS BE DETECTED?

Yes. Due to the colorless and odorless nature of LNG vapors, electronic methane gas detectors are used to identify the presence of natural gas. These detectors can identify concentrations of gas well below the level needed to combust. Additionally, due to the cold nature of LNG vapors, air moisture will condense into a visible cloud in the presence of an LNG spill.

2.5 CAN LNG SPILL OUT & TRAVEL ALONG THE GROUND?

Liquefied Natural Gas seldom travels along the ground or accumulates in low places like other liquid hydrocarbons do. LNG will absorb heat quickly when it makes contact with air or any other surface at ambient temperature, and vaporizes immediately and rapidly. When vaporization occurs, the gas becomes lighter than air and begins to rise.

2.6 WILL AN LNG SPILL POLLUTE THE GROUND OR WATERWAYS?

LNG will not pollute natural resources such as ground water, soil, wetlands, streams or beaches. It vaporizes quickly and completely, and doesn't contain any pollutants from the spill.

2.7 IS LNG FLAMMABLE?

LNG is not flammable in its liquid state, but it is flammable as a vapor mixed with air. Due to the rapid evaporation of LNG when exposed to ambient temperatures, natural gas vapors are present immediately upon exposure to the environment. In order for combustion to occur, the percentage of natural gas present in air must be between five and fifteen percent.

2.8 WHAT ARE THE HEALTH EFFECTS?

- **Health Issues:** The principal component of natural gas is methane, and is not considered to be toxic. The American Conference of Governmental Industrial Hygienists (ACGIH) considers this gas as a simple asphyxiant, which is a health risk simply because they can displace oxygen in a closed environment.
- **Skin:** Workers can receive cryogenic burns from direct body contact with cryogenic liquids, metals, and cold gases. Exposure to LNG or direct contact with metal at cryogenic temperatures can damage skin tissue more rapidly than when exposed to vapor. It is also possible for personnel to move away from the cold gas before injury.
- **Inhalation:** Liquefied Natural Gas vapors are considered to be non-toxic by inhalation. Inhalation of high concentrations may cause central nervous system depression such as: dizziness, drowsiness, headache, and similar narcotic symptoms, but no long term effects. Numbness and vomiting have been reported from accidental exposure to high concentrations. LNG vapors are a simple asphyxiant and high concentrations displace oxygen from the breathing atmosphere.

2.9 EQUIPMENT ONSITE

- LNG Tank(S) Maximum Gross On Site Capacity Is 36k Gallons.
- LNG Dispensing Pump Skid(S).
- LNG Offload and Transfer Pump Skid.
- LNG Saturation Vaporizer (Heat Exchanger Tower).
- Island Mounted LNG Dispenser(S).
- Liquid-To-Compressed Natural Gas (LCNG) Pump System (Optional).
- Island Mounted CNG Dispenser(S) (Optional).
- LCNG Liquid-To-Gas Vaporizer(S) (Heat Exchanger Tower) (Optional).
- CNG Vapor Compressor (Optional).
- CNG Storage Vessels (Elongated Pressure Vessel Tubes) (Optional).
- CNG Mercaptan Injection System (Mercaptan Storage Vessel) (Optional).
- Fueling Island Canopy.
- Electrical Enclosure Structural Awning.
- Block Wall Containment Structure, Rated For Crash-Protection.
- Electrical Cabinet (24v – 480v, 3-Phase).

3 PROPERTIES OF LIQUEFIED NATURAL GAS

3.1 TYPICAL CHEMICAL COMPOSITION

Component	CAS #	Concentration % per volume	DL 50	CL 50
Methane	74-82-8	99.5	N/A	N/A
Nitrogen	74-84-0	00.5	N/A	N/A

Expansion Ratio

620 to 1 from liquid to vapor

3.2 PHYSICO-CHEMICAL CHARACTERISTICS (METHANE)

Molecular formula	CH_4
Physical form	Liquefied gas (cryogenic liquid)
Appearance	Limpid liquid
Cold vapor	White cloud
Color and odor	Colorless and odorless
Vapor density (air)	0.6
Boiling point	-258.7 °F (-161.5 °C)
Freezing point	-296.5 °F (-182.47°C)
Density	0.415 at -263.2 °F (-164°C)
Molecular weight	16.043 g/mol
Vapor pressure	4.52 Mpa
Evaporation rate	Not determined
Water/oil partition coefficient	0.0812
pH	Not applicable
Gas/liquid equivalent	630 v/v (1.013 bar, 15°C)

3.3 REACTIVITY

Chemical stability	Stable
Reactivity condition(s)	Keep away from sources of ignition and heat
Incompatible products	Keep away from air, O2, strong oxidizing agents
Hazardous decomposition	CO, CO_2, fumes
Polymerization	N/A

4 COMBUSTION PROPERTIES

Auto Ignition Temperature

- LNG = 999 °F (537 °C)

- Gasoline = 853 °F (456 °C)

Flammable Limits in Air

- LNG 5.3% to 14%
- Gasoline 1.4% to 7.4%

Flame Temperatures

- LNG = 2426 °F (1330 °C)
- Gasoline = 1880 °F (1027 °C)

Heat of Combustion

- LNG = 21,600 Btu/lb. / 80,445 Btu/gal
- Gasoline = 18,720 Btu/lb. / 126,300 Btu/gal

Vapor Density

- Is temperature dependent
- Positive buoyancy above -160 °F (-107 °C)
- Neutral buoyancy -160 °F (-107 °C)
- Negative buoyancy below -160 °F (-107 °C)

Vaporization Characteristics

- Initial vaporization rate on land of 10 cubic feet of vapor per 1 square foot of exposed liquid spill, per minute (10 cfm/sq. ft.).
- Vaporization Rate on water is 50 cubic feet of vapor per 1 square foot of exposed liquid spill, per minute (50 cfm/sq. ft.).
- Steady state vaporization rate on land of 1 cubic foot of vapor per square foot of exposed liquid spill, per minute (10 cfm/sq. ft.).

Burn Rate

An equal volume of gasoline will produce more total heat but burn slower with less intense thermal radiation and a smaller flame height.

- LNG 12.5 mm/minute (1/2 Inch per minute)
- Gasoline 4 mm/minute (steady state)

Thermal Flux Values (pool fire)

- Methane = 220 kW/m2

5 LNG GENERAL HAZARDS, SPILLS, AND FIRE SUPPRESSION

5.1 IGNITION HAZARD VS HEALTH HAZARD

As LNG concentrations rise, the lower flammable limit (minimum ignition limit) will be reached long before the dangers of low oxygen levels are present.

5.2 LOW TEMPERATURE HAZARDS

LNG is stored at -259 °F (-162 °C) in order to maintain its liquid state. Cryogenic injuries due to contact with liquid, cold surfaces or cold vapor may result in rapid freezing of tissue (frostbite).

Contact with cold vapor

Prolonged contact with cold vapor may result in: frostbite, breathing discomfort, respiratory difficulties, hypothermia. It is recommended to remove oneself from the area of a vapor to avoid such hazards.

5.3 VAPOR CLOUD CHARACTERISTICS

In the event that there is a Liquid Natural Gas spill, the LNG will immediately start to vaporize. Characteristics of the vapor cloud include the following:

- Vapor with downwind plume will produce a long, thin cigar shaped vapor cloud.
- Visibility is due to condensed water vapors.
- The danger may not always be within the visible cloud.
- Can travel considerable distances before concentrations fall below (LFL).
- The danger distance decreases as wind speed increases because it dilutes the gas.
- Containment walls will delay vapors from traveling downwind.
- Nearly all of the vapor clouds come from air mixing with the vapor.

5.4 VAPOR CLOUD IGNITION

The ignition of an unconfined LNG vapor cloud by typical ignition sources does not produce a pressure wave.

- Ignition of LNG vapors in a confined space can produce overpressures strong enough to cause severe damage.
- Ignition of a diluted cloud may produce limited thermal radiation.

5.5 BOILING LIQUID EXPANDING VAPOR EXPLOSIONS (BLEVE)

- **A BLEVE involving an LNG storage tank is highly unlikely.**
- BLEVE's have occurred with Liquefied Petroleum Gas tanks but not LNG tanks.
- LNG tanks are double walled, well insulated and vacuum jacketed.
- The outer shell will prevent direct flame impingement on the inner tank.
- Mechanical insulation between outer & inner wall drastically slows heat transfer to LNG.

5.6 RAPID PHASE TRANSITION (RPT)

An RPT occurs when the temperature difference between a hot liquid and a cold liquid is sufficient enough to drive the cold liquid rapidly to its superheat limit, resulting in spontaneous and explosive boiling of the cold liquid.

5.7 RPT THEORY

- LNG spilled on water involves sufficient temperature difference to produce large droplets or puddles of LNG supported above the water by a film of vapor.
- If the LNG is nearly pure methane, this nonviolent evaporation will continue until the Liquid Natural Gas is completely evaporated.
- If the LNG contains substantial proportions of ethane, propane, and/or butane, the methane will evaporate first, increasing the concentration of the heavier hydrocarbons.
- Ultimately the boiling point of LNG will increase until the heat transfer will no longer be adequate to produce the supporting vapor film.
- At this point the superheated LNG contacts the water, creating nucleation sites and very rapid heat transfer.
- This sudden, violent vaporization is known as the rapid phase transition (RPT).

6 METHODS FOR OFFLOADING LNG

1. Properly position and park the transport vehicle.
2. Set the parking brake.
3. Turn off the ignition.
4. Chock the wheels.
5. Put on all required personal protective equipment (PPE).
6. Verify the entire load will fit by viewing the monitor panel.
7. Attach the bonding cable to grounding lug.
8. Attach the unloading hose to the connection and tighten with brass hammer.
9. Turn the unloading station selector switch to “OFFLOAD” position.
10. Open the pressure builder valve on Transport and allow the pressure to build to 55-60 psi and monitor closely.
11. Open the liquid discharge valve on the transport.
12. Open the unloading station hose vent and close when the liquid enters vent stack (approximately 60 seconds).
13. Open the pump prime valve. When the liquid is heard in the vent stack, close the valve.
14. Continually monitor the transport pressure and tighten the hose fittings as necessary.
15. Press the “Start” button and closely monitor the pump discharge pressure gauge to ensure pump is primed.
16. If pump fails to prime, press the “Stop” button and repeat steps 13-15.
17. When the transport gauge indicates 5” of product remaining, close the pressure building valve.
18. When unloading is complete press the stop button.
19. Pump will also shut down automatically when the maximum tank volume is reached.
20. Close the transport liquid valve.
21. Close the liquid feed valve and open the hose bleed valve on transport.
22. Verify the hose is completely vented by periodically shaking the hose.
23. Remove the hose first and then the bonding cable.
24. Replace all protective caps.
25. Turn the unloading station selection switch to “OFF” and record tank readings.

7 METHOD FOR DISPENSING LNG

1. Properly position and park the truck.
2. Set the parking brake.
3. Turn off the ignition.
4. Chock the wheels.
5. Attach the ground clamp to the side of the fuel tank
   - Always transfer cryogenic liquids in well-ventilated areas.
   - Do not use any equipment that can generate sparks.
6. Swipe your payment card.
7. Put on all required Personal Protective Equipment (PPE);
   - Long pants,
   - Long sleeved shirt,
   - Long welding or cryogenic type gloves,
   - A face mask is optional but always recommended.
8. Begin fueling process at the dispenser.
9. Remove fuel cap.
10. Blow moisture from nozzle and tank receptacle with air hose.
    - Make sure to physically remove any visible debris
11. Attach nozzle to tank receptacle.
12. Evaluate the need to vent excessive tank pressure.
    - Vehicle tanks should be vented if pressure exceeds 150 psi before start of fueling.
    - Vent in accordance vehicle tank manufacturer instructions.
13. Push red safety stop lever down to ensure nozzle handles are back completely.
14. Slide nozzle onto tank receptacle then push handles forward.
15. Press start button.
16. Wait 30 – 40 seconds while dispenser cools.
17. The operation automatically stops upon a low flow signal from the meter.
18. Pull handles until they stop.
19. Allow gasses to vent completely.
20. Push red safety stop lever then pull handles back to remove nozzle.
21. Replace nozzle to dispenser receptacle
22. Detach the ground clamp on the side of the fuel tank
23. Replace vehicle fuel cap.
24. Remove protective clothing.

8 LNG FUELING STATION SAFETY EQUIPMENT

8.1 METHANE DETECTORS

Each LNG fueling station has multiple methane detectors. They have a measuring range of 0-100% of the lower flammable limit (LFL). Methane detectors are set to activate the alarm system at 20% and/or 40% of the lower flammable limit, as further described below. The exact locations are illustrated in the layout drawings.

A typical layout is as follows:

- A methane detector is located near the LNG offload area, adjacent to the LNG transport offload skid.
- A methane detector located on the LNG dispense pump skid adjacent to the storage tank inside the containment area.
- A methane detector located near each of the LNG dispensers.
  (The exact number varies depending on the number of dispensers)

8.2 FLAME DETECTORS

Each LNG fueling station is provided with at least four (4) Ultraviolet/Infrared Flame Detectors. The flame detectors are located on poles above each corner of the LNG containment wall. The flame detectors are oriented to provide overlapping fields of view for the whole containment area, offload area, and dispensing areas.

8.3 EMERGENCY SHUTDOWN DEVICE

The LNG fueling station is provided with multiple emergency shutdown devices (ESD). There are emergency shutdown devices located near each of the two sets of stairs which climb over the containment wall. One emergency shutdown device is located on the containment wall, in the offload control panel area. An emergency shutdown device is located at each of the LNG dispensers. One emergency shutdown device (ESD) is located on the outside of the wall surrounding the control area. There is also an emergency shutdown device located on the front of the control panel inside the gated control area.

8.4 ALARM SYSTEM

Yellow and red alarm beacons are located above the electrical control cabinet. An alarm horn is also located on the top of the electrical control cabinet. When the alarm system has been activated the horn can be silenced by the pressing the “Alarm Silence” button on the front of the main electrical cabinet. Alarms can be acknowledged, thereby turning off the beacons, horn, and allowing the LNG station to be placed into service. These actions can be taken on the HMI (Human Machine Interface) on the front of the control panel. If an alarm is acknowledged, but the condition causing the alarm is still present, such as methane detection, the alarm will not be cleared and the LNG station will not be allowed to be operated. The yellow or red beacons will remain illuminated.

8.5 FIRE EXTINGUISHERS

Each LNG fueling station has multiple fire extinguishers. The exact locations are illustrated in the layout drawings. A typical layout is as follows:

- All fire extinguishers are 20 # dry chemical type rated 20A:120B:C.
- Located at or near the LNG offload area.
- Near the set of stairs over the containment wall.
- At or near each fuel dispensing area.

When a cryogenic liquid such as LNG is suddenly heated by contacting a warm liquid such as water, violent boiling of the LNG can occur, resulting in localized overpressure release. For this reason, most of the water base agents are not only ineffective, but their application on an LNG spill can worsen the fire.

Note: Do not use water or water based mixtures to extinguish an LNG fire.

8.6 CONTROL, MAINTENACE ALARMS, AND COMMUNICATION

Typically, a Viking model: K-2000-DVA auto-dialer is installed for communication of control and maintenance alarms, inside the main control cabinet. The auto-dialer is programmed to call Clean Energy's third party maintenance hotline whenever a particular alarm zone is triggered. The third party responder will then communicate directly with Clean Energy operations and maintenance staff, following a lengthy list of prioritized contact phone numbers. A total of six notification zones are programmed to communicate through the auto-dialer:

- **Zone 1, Methane Alarm**
- **Zone 2, Flame Alarm**
- **Zone 3, Emergency Shutdown Device**
- **Zone 4, Process Control Alarm**
- **Zone 5, Methane Device Fault**
- **Zone 6, Flame Device Fault**

8.7 FIRE ALARM CONTROL PANEL

A Fire Alarm Control Panel (FACP) is installed in the same cabinet as the auto-dialer and control PLC. The sole purpose of the FACP is to automatically dial the local fire department first responder hotline, or a UL listed fire alarm monitoring company (when requested by the local authority). The FACP provided is typically manufactured by Silent Knight, model number: 5208. The specific zone triggering the FACP is as follows:

- **Zone 2, Flame Alarm:** FACP to Notify Fire Department directly, or through UL listed fire alarm monitoring company (when requested by local authority)

8.8 ADDITIONAL SAFETY FEATURES

- Each section of LNG piping is equipped with a pressure relief valves (PRV's).
- The storage tank(s) are equipped with dual relief valve and rupture disc assembly.
- Each dispense hose is equipped with a breakaway device to allow a controlled separation in a drive-away event, and to terminate flow of fuel.
- If the LNG dispenser exceeds a maximum allowable flow rate the control system interprets this as a possible ruptured hose and terminates fueling.
- If the total gallons of LNG dispensed exceed a predetermined maximum allowable amount, the control system interprets this as a possible ruptured hose and terminates fueling.
- Containment area and control areas are protected by fencing with locked gates.
- The emergency shutdown system is designed to actuate all valves to a fail-safe position, turn off all pumps and equipment. Additionally, the safety system will remove power from all electrical equipment in the event of 40% LFL methane detection, fire detection, or activation of an emergency shutdown device.
- Clean Energy is in the process of deploying security camera's at all LNG public fueling stations. The number and locations of cameras are to be determined.

9 EMERGENCY CLASSIFICATION DETERMINATION

9.1 DEFINITION OF EMERGENCY

An emergency is a condition or event that causes actual or a threatened escape of LNG from the system in such a quantity and under such circumstances that the liquid or gas could reasonably be expected to become a hazard to people or property or there is an actual or threatened interruption of service to customers, other than planned interruptions.

9.2 CONTROLLABLE EMERGENCY

Any emergency where Clean Energy personnel can prevent harm to other personnel, customers, vendors or equipment by following standard operating procedures (SOP's) such as shutting down equipment, isolating system or initiating the Emergency Shutdown System.

Controllable Emergencies include:

- LNG spills contained within the spill containments that do not result in fire.
- Overpressure of gas or liquid process piping.
- Small fires that do not involve flammable gases.
- Electrical fires that do not involve flammable gases.
- Loss of electrical power.
- Unexpected LNG point of transfer disconnection.
- Minor vehicle accidents.
- Securing the site prior to severe weather conditions.
- Security breaches that do not result in substantial damage to the station.

9.3 UNCONTROLLABLE EMERGENCY

Any emergency in which the Clean Energy personnel cannot prevent harm to personnel or equipment by taking reasonable actions such as shutting down equipment, isolating system or initiating the Emergency Shutdown System.

Uncontrollable Emergencies include:

- LNG spills not contained by the spill containments and do not result in fire.
- LNG spills not contained by the containments and result in an unconfined fire.
- Flammable gas leaks from significant failure of a pipeline or equipment.
- Building or equipment fires that contain or can contain flammable gases.
- Structural failure of an LNG storage tank.
- Severe weather conditions that can cause damage to equipment and systems or loss of containment of LNG or flammable gases.
- An act of sabotage that may result in structural failure of an LNG storage tank or rupture of an LNG tank or major pipeline.

10 RESPONSE PROCEDURES

10.1 RESPONSE TO EMERGENCIES

Emergency situations and events will vary widely and will require various levels of management to direct the handling of the emergency and subsequent restoration of operations and reporting.

10.2 EXAMPLES OF POSSIBLE EMERGENCIES

The following are examples of situations that could result in emergencies throughout the Clean Energy service area:

- Event or fire that involves or threatens the LNG facility.
- Detection of gas/methane (as measured with a combustible gas indicator).
- Uncontrolled escape of LNG.
- LNG pressure that is outside prescribed limits.
- Damage to our facilities by third parties.
- Civil disturbance that can result in damage to gas facilities may include: Protests, riots, bomb threats or terroristic acts, or natural disasters.

10.3 DISPATCHING EMERGENCY PERSONNEL

In response to a notice of a possible emergency, a Technician or the Operations Director may be dispatched to the location. Upon arrival, they should perform the functions outlined below, as required, and according to their discretion. It is important to prevent bodily injury first and then make the area safe.

10.4 IMMEDIATE ON-SITE ACTION

Upon arrival at the site, the first responder shall assess the nature of the complaint and determine if it is LNG related. This assessment should include the status of the emergency, an estimation of how the incident might progress, and an evaluation of whether or not additional manpower, equipment, and materials are needed to adequately cope with the situation.

11 INCIDENT COMMANDER SYSTEM (ICS)

11.1 INCIDENT COMMANDER: FIRST IN COMPANY OFFICER

For emergencies that do not involve a fire, the ranking company employee at the scene will be designated the Incident Commander. The Incident Commander is responsible for directing and coordinating the overall emergency response.

- If a fire is involved, this position will be assumed by the ranking officer of the fire department. In such cases, the Command Center may provide overall coordination of the incident and the onsite Incident Commander will be responsible for on-site activities.
- To help insure coordination during the emergency, the Incident Commander will normally appoint specific persons to perform specific tasks. Incident Commander should make a written record of the persons assigned to various tasks. This will help define the temporary chain of command that will be used during the emergency.

11.2 FIRST RESPONDER

The primary role of the first responder is to evaluate the situation and notify the appropriate Company and/or emergency response personnel. Once the situation has been assessed, the First Responder should attempt to make the situation safe. The First Responder should assume role of Incident Commander until Management arrives.

11.3 FIRE DEPARTMENT (ROLES & RESPONSIBILITIES)

The Incident commander should make contact with the senior fire officer upon his arrival. The senior fire officer commands the fire-fighting and rescue operation. A representative should remain with the senior fire officer to provide guidance and advice about the LNG station.

11.4 POLICE DEPARTMENTS (ROLES & RESPONSIBILITIES)

Responsible for controlling the movement of traffic, evacuation of people when necessary, control of sightseers, and the protection of operating personnel during civil disturbances. If the incident was a result of a deliberate act amounting to criminal conduct, the police should perform a thorough and detailed investigation.

11.5 MEDIA RELATIONS

In the event of an emergency, it is critical that information released to public agencies, the media, and ultimately the general public be accurate. Clean Energy's Media Relations Coordinator will be responsible for the initiation and execution of steps to maintain good public relations in the community involved. Generally, this will involve going to the scene of the emergency and serving as the liaison with newspaper, television, radio and wire service representatives.

At the emergency area, Media Relations should immediately consult with the Incident Commander and assess the situation. During an emergency situation, employees may be contacted by the media or by members of the general public regarding the emergency. Proper procedure is as follows:

- Only the Media Relations Coordinator is authorized to provide information to the media, local agencies or the public.
- Employees shall refer all persons with questions regarding the emergency to the Media Relations Coordinator.
- The Media Relations Coordinator is designated as the information point of contact by Clean Energy and acts as the spokesperson for disseminating information to all media outlets and also local and state emergency organizations.

In the event of an emergency please direct media and agency questions to:

Gary Foster
Senior Vice President of Communications
Clean Energy Fuels Corp
gfoster@cleanenergyfuels.com

Phone: 949-437-1113
Cell: 562-774-7056

12 FEDERAL/STATE REPORTING REQUIREMENTS

12.1 (INCIDENT REPORTING RESPONSIBILITIES)

Upon discovery of a potential incident, onsite operations personnel shall notify the Operations Director. The Operations Director shall notify the Safety Manager and be responsible for telephonic notification to the appropriate state and federal agencies. Written reports shall be submitted as soon as practicable but not more than 30 days after detection of the incident. Efforts shall be made to make notifications within two (2) hours unless extenuating circumstances necessitate longer duration. The telephonic notifications shall:

- The identity of reporting company.
- The name and phone number of the individual reporting the incident.
- The location and time of the incident (City, county, state, and street address).
- The time of the incident (Date and hour).
- The number of fatalities and personal injuries (if any).
- Type and extent of property damage.
- The description of the incident.
- All other significant facts relevant to the cause of the incident.

13 POST INCIDENT INVESTIGATION, REVIEW, AND CORRECTION

13.1 INVESTIGATION PROCEDURES

An investigation should be conducted, if applicable, as soon after the end of the emergency as possible. The following procedures should be performed as appropriate and should include the following: establish liaison with fire and police officials, obtain names and addresses of all witnesses, speak to witnesses if possible to obtain pertinent information, document all personal observations by making notes as to the condition and location of all gas metering facilities and position of valves and list all gas appliances present.

If the incident is a fire, the following items may be noted:

- Location where flames appear to be most intense.
- Color of flames and/or smoke.
- Speed at which the fire progresses.
- Actions of Fire Department.
- Unusual color or odors.
- Existence of multiple fires.
- Flammable liquids or containers.
- Condition of doors and windows.
- Document findings and actions taken, if appropriate, photograph all work.
- Document observations of damage.
- Prepare a sketch of the area showing, structure location, orientation of sketch, location of street/s and location of ignition sources.
- Speak to witnesses, if possible, to obtain pertinent information.
- Preserve all pertinent documents, including leak surveillance, pressure tests documentation.

13.2 REVIEW OF EMPLOYEES ACTIVITIES FOLLOWING AN INCIDENT

Following a response to an emergency involving a reportable incident or similar significant occurrence, it shall be the responsibility of the Operations Director of all employees involved in the response to review the incident.

13.3 INVESTIGATION OF FAILURES / INCIDENTS

Investigations of material failures that do not result in a reportable incident may involve some of the items and activities listed below, as applicable. Investigations of LNG and third party damage to LNG stations should be made only after steps have been taken to protect public safety first and then property.

13.4 INCIDENT INVESTIGATION

The Operations Director or his/her designee will determine if an investigation is applicable. Company personnel not associated with the Incident Investigation should only be at the incident site on request. The investigator will make a complete and objective investigation in order to establish the true cause of the incident and to minimize the possibility of recurrence.

13.5 DEVELOPING AND MAINTAINING AN INCIDENT LOG

Incident logs should be kept by the responding Technician or designee in charge at the site. Notes should be kept about persons notified, response activities requested and implemented, and the time of each response event. Information obtained from the logs may be useful in developing reports and critiquing personnel response to the incident.

13.6 PHOTOGRAPHIC DOCUMENTATION WORKSHEET

Copies of all photographs shall be maintained with the final report.

13.7 ANNUAL REVIEW

An annual review of the Emergency Response Plan shall be conducted to provide a general familiarization with the plan. Particular emphasis shall be placed on the section of the plan that most directly involves the employee's area of responsibility.

13.8 RESPONSE CRITIQUE / PLAN REVIEW AND MODIFICATION PROCESS

Immediately following any incident that results in notification of emergency response agencies, Clean Energy shall convene an incident review committee. This committee shall immediately prepare a report of the incident and a critique of the response actions taken by employees and management. This report shall be issued within one week of the date of the incident and a copy provided to the safety management.

14 FIREFIGHTING INSTRUCTIONS

14.1 EMERGENCY ORGANIZATION

Clean Energy LNG Fueling stations do not have an on-site emergency response team. When a site emergency or abnormal operating condition occurs, resulting in a hazard to public safety immediately contact fire, police, and the 911 center. The purpose is to coordinate both planned responses and actual responses for the duration of the emergency or abnormal operating condition. Emergency responders are utilized to abate the emergency and render the area safe. Clean Energy representatives will respond to site emergencies for assistance.

In the case of pressure fires in both the vapor and liquid states, there are important variables that will directly influence the ease or difficulty of extinguishment:

- If the natural gas is making contact on a vertical surface such as process equipment or a horizontal surface such as the ground, a fire will be significantly more difficult to extinguish than if it is not impinging on a surface.
- The length of time that a fire has been burning will increase the extinguishing agent application rate that is required.
- Obstructions in the fire area will influence the number of extinguishing application access points required to adequately extinguish.
- The behavior of LNG in a spill situation is a consideration in determining extinguishing agent application requirements.
- Characteristics of the surface where the spill occurs can influence the initial rate of vaporization.
- Due to a higher rate of vaporization, a more intense fire will occur in an initial spill situation then one at a steady-state.

14.2 APPLICATION OF WATER TO LNG FIRES

When a cryogenic liquid such as LNG is suddenly heated by contacting a warm liquid such as water, violent boiling of the LNG can occur, resulting in localized overpressure releases. For this reason, most of the water base agents are not only ineffective, but their application on an LNG spill can worsen the fire.

Exception:

- High expansion foam on LNG fires can assist vapor dispersion and fire control.

14.3 CAPABILITIES OF DRY CHEMICAL

The only known agents that have demonstrated the ability to completely extinguish LNG fires are the dry chemicals.

- **Sodium Bicarbonate Base:** This agent, which is the dry chemical first developed, has been largely replaced by the more effective potassium bicarbonate base material in the oil and gas industry.
- **Monoammonium Phosphate Base:** This agent is approximately as effective as the sodium bicarbonate base material on flammable liquids and vapors. It has the added advantage of being an effective extinguishing agent in Class A (ordinary combustibles) fires.
- **Potassium Bicarbonate Base (Purple-K):** This agent has been shown to be more effective than the sodium bicarbonate base material and has become the standard dry chemical in high intensity fire applications.

4675 MacArthur Court, Suite 800
Newport Beach CA 92660

SITE SPECIFIC INFORMATION

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SITE SPECIFIC LNG STATION INFORMATION

SITE NAME: West Branch, IA - Tidewater
Site ID #: 133-12-20253
Site Address: Tidewater Drive, 41.660818, -91.344784
City of: West Branch
State of: Iowa
Zip Code: 52358
County of: Cedar
Contact Name: Bill Vernon
Contact Phone: (303) 322-4600

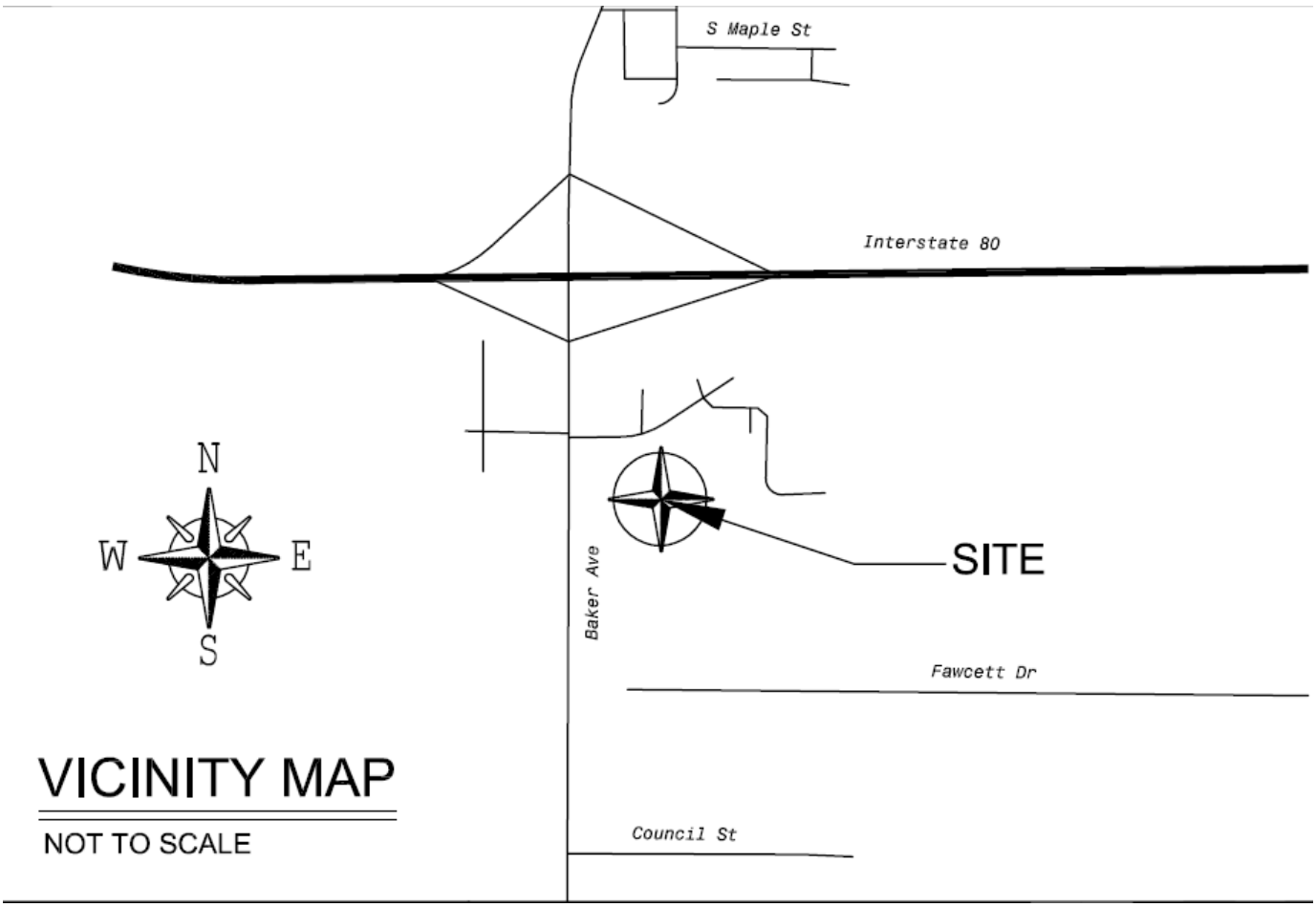
OWNER NAME: Clean Energy
Owner Address: 4675 MacArthur Court, Suite 800
City of: Newport Beach
State of: California
Zip Code: 92660
Owner Contact:
Contact Phone: (949) 437-1000

LNG SUPPLIER:
Method of Delivery:
Intended Flow:
Total Shelf Life:
Size of Storage: 18,000 Gallon
LNG Storage:
Type of Tanks:
Number of Tanks: 1
Use of the LNG: Long Haul Trucking
Dispense Pressure:

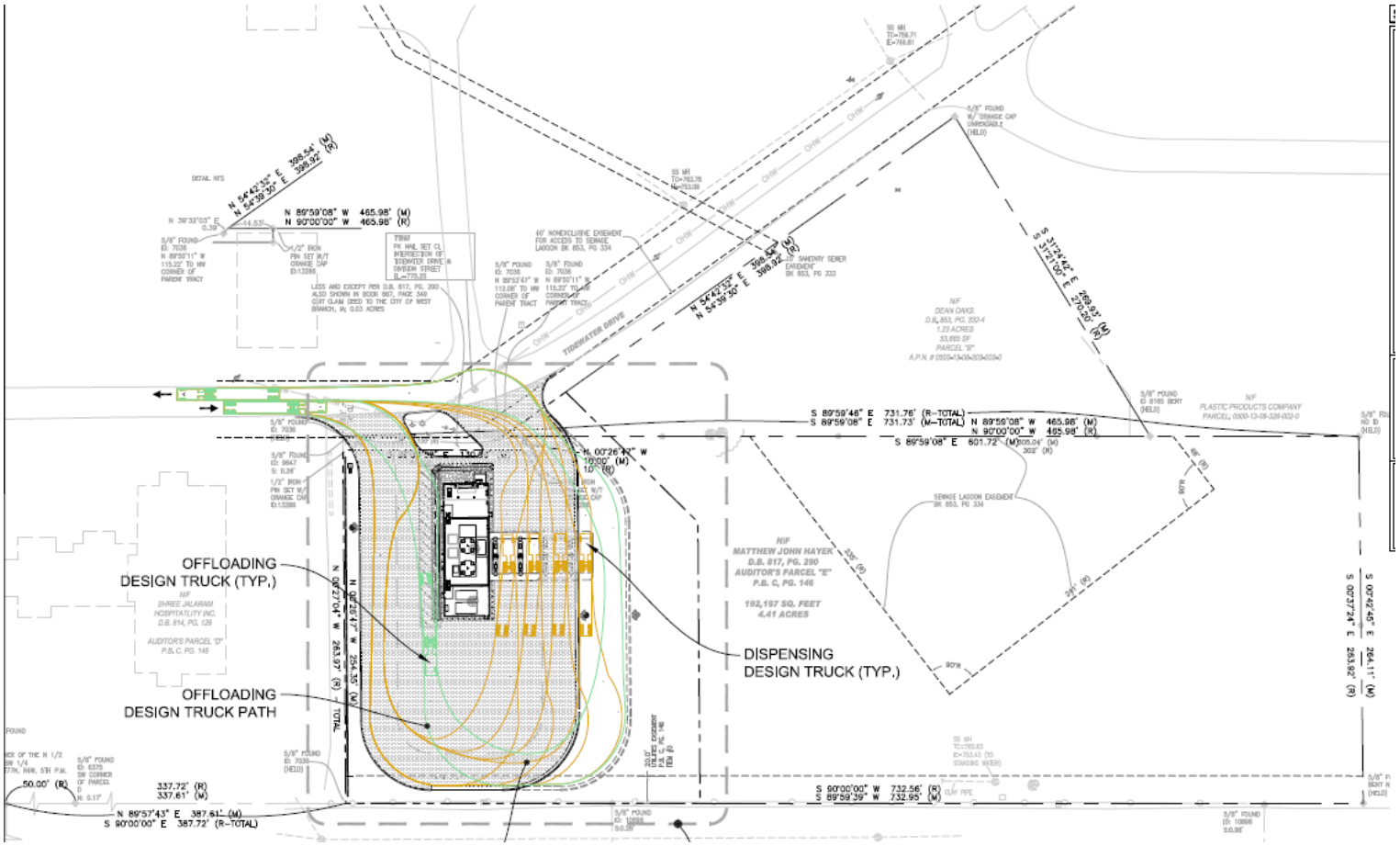
SITE DESCRIPTION

Liquefied Natural Gas (LNG) Fueling Station designed for unloading, storage and dispensing of LNG. System consists of: 18,000 gallon LNG storage (expandable to 36,000 gallon capacity), ancillary off-loading and dispensing equipment, electrical equipment and controls, and Flame and Gas detection systems for the dispensing of LNG through (2) LNG Fueling dispensers.

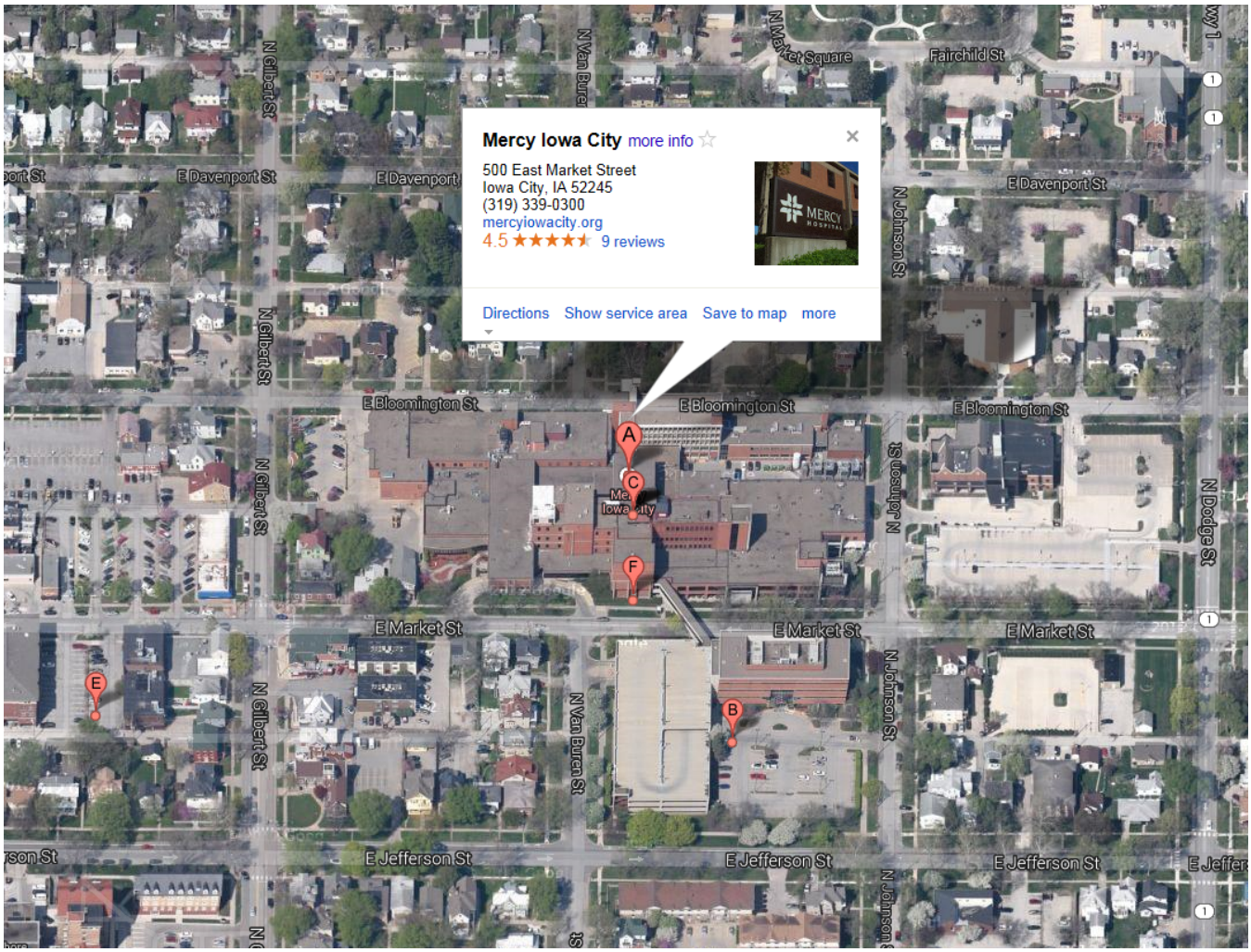
SITE MAP


S Maple St
Interstate 80
N
W
E
S
SITE
Baker Ave
Fawcett Dr
Council St
VICINITY MAP
NOT TO SCALE

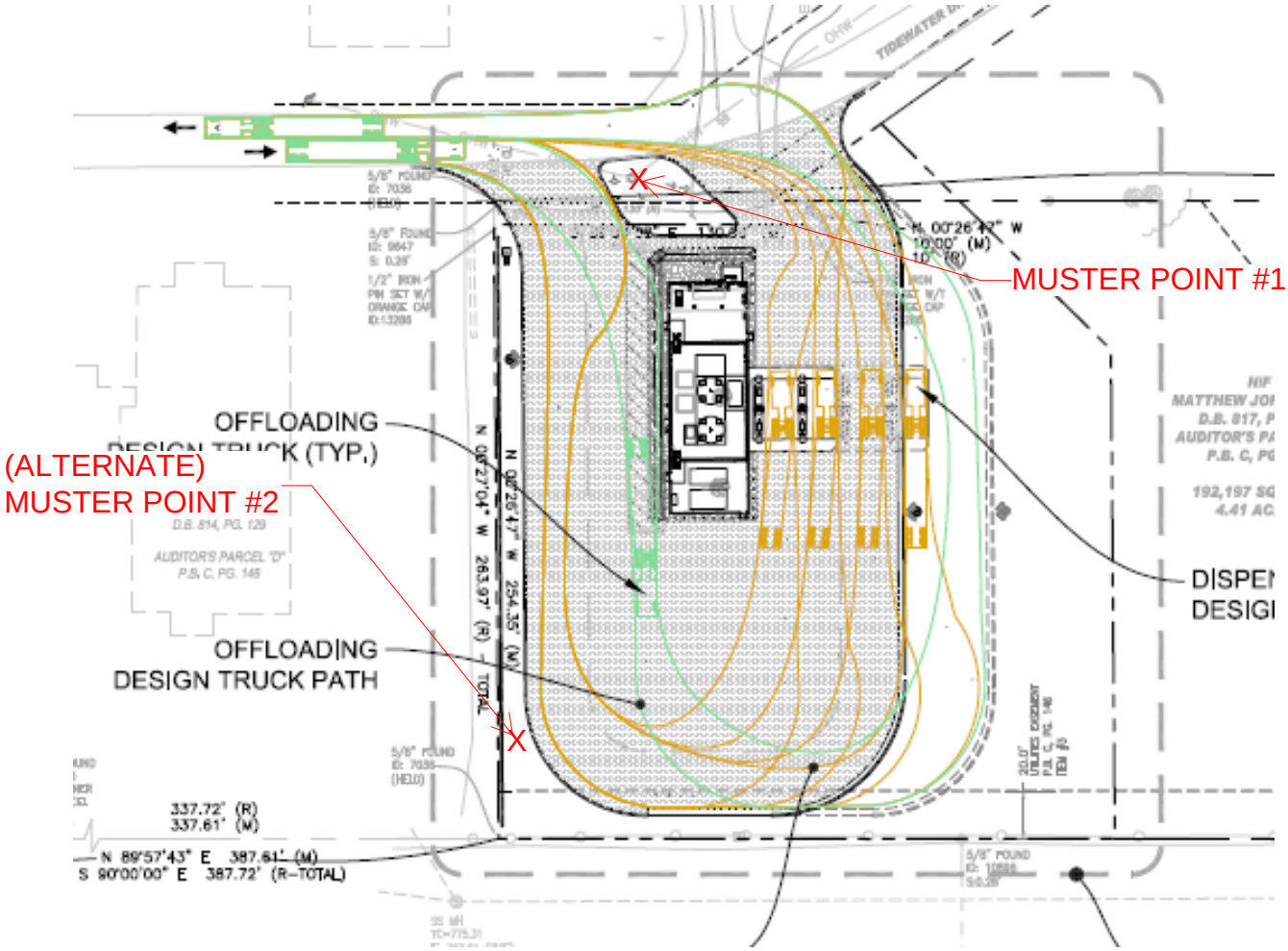
ADJACENT BUILDINGS & FACILITIES



NEAREST MEDICAL FACILITY



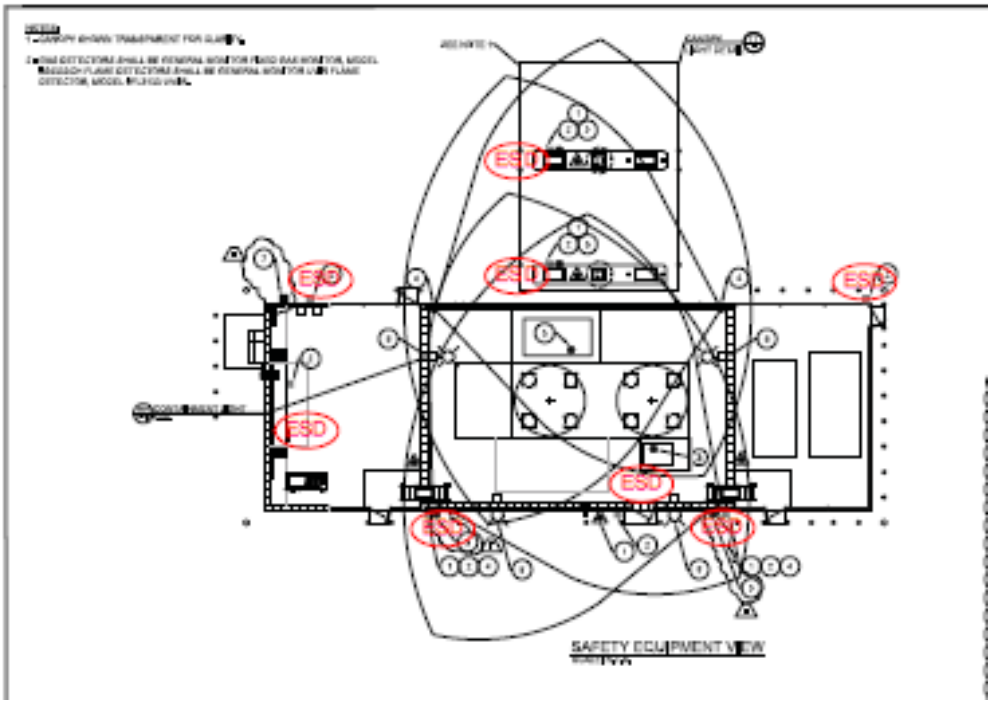
EVACUATION ROUTES



Evacuation:
In the event that a site evacuation is required, personnel shall evacuate and direct those nearby to the North End of the Property ("MUSTER POINT #1"). Dependent on the direction of the wind, personnel may use "(ALTERNATE) MUSTER POINT #2" on the South West Side of the Property.

During an evacuation, particular attention shall be paid to the prevailing wind: ALWAYS EVACUATE CROSSWIND AND/OR UPWIND FROM THE LOCATION OF EMERGENCY.

EMERGENCY SHUTDOWN DEVICE (ESD) LOCATIONS



HMBP

(HAZARDOUS MATERIAL BUSINESS PLAN)

MATERIAL SAFETY DATA SHEETS (MSDS) / SAFETY DATA SHEETS (SDS)

4675 MacArthur Court, Suite 800
Newport Beach CA 92660

EMERGENCY RESPONSE PROCEDURES

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1 EMERGENCY CONTACTS

EMERGENCY SERVICES	PRIMARY	ALTERNATE/CELL
Fire Department	911	911
Paramedics	911	911
Police Department	911	911
CLEAN ENERGY 24/7 EMERGENCY		
Include Station Name and Number	866-278-3674	866-278-3674
VICE PRESIDENT OF OPERATIONS		
Bart Frabotta	949-437-1200	562-282-2173
CORPORATE SAFETY MANAGER		
James Wright	949-437-1207	562-418-8944
CHIEF OPERATING OFFICER		
Mitchell Pratt	949-437-1111	562-619-0013
VICE PRESIDENT OF ADMINISTRATION		
Barbara Johnson	949-437-1130	714-336-0511
MEDIA RELATIONS		
Gary Foster	949-437-1113	562-744-7056
DIRECTOR OF OPERATIONS - NORTHEAST		
Scott Scrima	949-437-1213	562-370-7079
DIRECTOR OF OPERATIONS – SOUTHEAST		
Brooks McAllister	770-735-3912	770-508-4113
DIRECTOR OF OPERATIONS - CENTRAL		
Bill Vernon	303-322-4600	303-503-9458
DIRECTOR OF OPERATIONS - WEST		
Tom Bressler	949-437-1214	562-305-7264

2 RESPONDING TO AN EMERGENCY

2.1 MINOR INCIDENT – PRESSING AN EMERGENCY STOP DEVICE (ESD)

Pressing the Emergency Shutdown System will take the following actions:

- Red alarm beacon is illuminated.
- Alarm horn is activated.
- Methane detected circuit on the fire alarm control panel is activated.
- Fire alarm control panel initiates communication according to the pre-programmed phone number schedule.
- Alarm is logged into the alarm system of the Programmable Logic Controller (PLC).
- The LNG station is shutdown.
- All air operated valves close automatically if air pressure is removed from the system.
- The pumps are shutdown, if they are operating.
- Electrical power to all electrical equipment is disconnected.

To clear an alarm after the emergency stop device has been engaged:

- The alarm reset button on the front of the control panel must be pressed.
- Alarm must be acknowledged on PLC interface screen on front of the control cabinet.

2.2 MINOR INCIDENT: METHANE DETECTION - 20% LOWER FLAMMABLE LIMIT

If methane is detected at a level of 20% of the lower flammable limit, the Emergency Shutdown System will take the following actions:

- Amber alarm beacon is illuminated.
- Alarm horn is turned on.
- Methane detected circuit on the fire alarm control panel is activated.
- Fire alarm control panel initiates communication according to the preprogrammed phone number schedule.
- Alarm is logged into the alarm system of the Programmable Logic Controller (PLC).
- LNG station is shut down.
- All air operated valves close automatically if air pressure is removed from the system.
- Pumps are shut down, if they are operating.
- Electrical power to all electrical equipment is **not** disconnected as it is for 40% Methane detection and flame protection.

Clearing A 20% Methane LFL Alarm:

- Methane level detected must fall below 20% of the lower flammable limit.
- Press the alarm reset button on the front of the control panel.
- If the reset button is pressed while the detector is still reading 20% or more of the LFL the alarm will remain active and the amber beacon will remain illuminated.
- Acknowledge alarm on the PLC interface screen on the front of the control cabinet.

2.3 MINOR EMERGENCY: METHANE DETECTION - 40% LOWER FLAMMABLE LIMIT

If methane is detected at a level of 40% of the lower flammable limit the Emergency Shutdown System will take the following actions:

- Red alarm beacon is illuminated.
- Methane detected circuit on the fire alarm control panel is activated.
- Fire alarm control panel initiates communication to monitoring service, fire department and a Clean Energy technician is notified.
- The alarm horn is turned activated.
- Alarm is logged into the alarm system of the Programmable Logic Controller (PLC) LNG station is shut down.
- All air operated valves close automatically if air pressure is removed from the system.
- Electrical power is disconnected, causing the pump to stop if it is operating.

Clearing A 40% Methane LFL Alarm:

- Methane level detected must fall below 40% of the lower flammable limit.
- While the 40% methane alarm is active, press the alarm silence button on the front of the control panel.
- This will silence the alarm horn but will not clear the alarm or turn off the red beacon.
- The alarm reset button on the front of the control panel must be pressed.
- If the reset button is pressed while the detector is still reading 40% or more of the LFL the alarm will remain active and the amber beacon will remain illuminated.
- Pressing the reset button on the control panel will restore power to the LNG pump skid and the LNG dispensers.
- No automatic process will be permitted to start.
- Offloading and dispensing will not be permitted to start until all alarms are cleared on the HMI screen of the PLC control system, located on the front of the control panel.
- When power is removed from the pump during the shutdown, it will be necessary to clear this PLC administrative alarm before the pump will be allowed to start.

3 PERSONAL PROTECTIVE EQUIPMENT (PPE)

ANSI Z87.1 APPROVED SAFETY GLASSES

- All onsite personnel shall wear *ANSI Z87.1* approved safety glasses.
- Corrective lenses require *ANSI Z87.1* approved over-glasses or goggles.
- Corrective lenses worn as safety glasses shall provide both front and side impact protection and be *ANSI Z87.1* approved.
- Sunglasses are not safety glasses unless marked with *ANSI Z87.1.*

REFLECTIVE SAFETY VEST

- *ANSI/ISEA Class II* type vest shall be worn at all times (lime green).
- All contractors and visitors onsite shall wear safety vests at all times.
- Colored work shirts are not suitable replacements for safety vests.

WORK GLOVES

- Shall wear long leather gloves sufficient enough to prevent skin contact.
- 14 in. leather welding type glove with non-elastic cuffs are recommended.

WORK SHIRT

- Shall wear long sleeve work shirts with the sleeve extending to at least the wrist.
- Heavy cotton or FR type long sleeve work shirts with sleeves extending to the wrist are recommended.

WORK PANTS

- Heavy cotton or FR type work pants extending to the boot are recommended.
- Shall wear durable long work pants, absolutely no shorts, sweat pants or athletic gear.

CLOSED TOED SHOES

- Shall wear shoes preventing exposure to the skin and offering sufficient traction to prevent slip/trips or falls from any wet or spilled material.
- Absolutely no open toed shoes, flip flops or sandals.

FACE SHIELDS

- Optional, but recommended for additional splash protection.
- If utilized shall be ANSI Z87.1 approved and worn in addition to not in lieu of approved safety glasses.