

**FIRE DEPARTMENT • CITY OF NEW YORK**



**STUDY MATERIAL FOR THE  
CERTIFICATE OF FITNESS EXAMINATION**

**G-19**

**SUPERVISION OF SANITARY LANDFILL METHANE RECOVERY  
FACILITIES (G-19)**

## NOTICE OF EXAMINATION

### **Title: Examination for Certificate of Fitness for Supervision of Sanitary Landfill Methane Recovery Facilities (G-19).**

**Date of Test:** Written tests are conducted Monday through Friday (except legal holidays) 8:00 AM to 2:30 PM.

### **QUALIFICATION REQUIREMENTS**

1. Applicants must be at least 18 years of age.
2. Applicants must have a reasonable understanding of the English language.
3. Applicant must provide two forms of identification, at least one identification must be government issued photo identification, such as a State-issued Drivers' License or Non Drivers License or a passport.
4. The applicant must have at least 6 months of satisfactory work experience under the supervision of G-19 Certificate of Fitness holder.
5. High-School Diploma, GED or equivalent.
6. Applicants must present a letter of recommendation from his/her employer. The letter must be on official letterhead, and must state the applicant's full name, experience as indicated in item 4 above, and the address where the applicant will work. If the applicants are self-employed or the principal of the company, they must submit a notarized letter attesting to their qualifications. The sample letters are available at the link below [http://www.nyc.gov/html/fdny/html/c\\_of\\_f/cof\\_requirements.shtml](http://www.nyc.gov/html/fdny/html/c_of_f/cof_requirements.shtml) or the Public Certification Unit, 1st floor, 9 Metrotech Center, Brooklyn.

### **APPLICATION INFORMATION**

**Application Fees:** \$25 for originals and \$15 for renewals. The fee may be paid by cash, money order, credit card, debit card or personal check made payable to the New York City Fire Department. The \$25 fee must be paid by all applicants prior to taking the Certificate of Fitness test.

**Application Forms:** Application forms are available at the Public Certification Unit, 1st floor, 9 Metro Tech Center, Brooklyn, NY 11201.

## **RENEWAL REQUIREMENTS**

You will receive a courtesy notice of renewal 90 days before the expiration date; however, it is your responsibility to renew your Certificate. It is very important to renew your C of F before it expires.

For renewal, send the renewal notification or a letter stating the C of F # with a fee of \$15, money order or personal check payable to “Fire Department City of New York“ to:

FDNY (Cashier’s Unit)  
9 MetroTech Center,  
Brooklyn, NY 11201

Late renewals (90 days after the expiration date, up to 1 year) will incur a \$ 25 penalty in addition to the renewal fee. Certificates expired over one year past expiration date will not be renewed. New tests will be required. FDNY also reserves the right to require the applicants to take a re-examination upon submission of renewal applications.

## **TEST INFORMATION**

The G-19 test will consist of 25 multiple-choice questions, administered on a “touch screen” computer monitor. It is a time-limit test. A passing score of at least 70% is required in order to secure a Certificate of Fitness. Call (718) 999-1988 for additional information and forms.

## **WEBSITE**

Please always check for the latest revised booklet at FDNY website before you take the test, the Certificate of Fitness Study Material link, below [http://www.nyc.gov/html/fdny/html/c\\_of\\_f/cof\\_study\\_materials.shtml](http://www.nyc.gov/html/fdny/html/c_of_f/cof_study_materials.shtml)

**EXISTING AS WELL AS NEW G-19 APPLICANTS ARE  
REQUIRED TO TAKE THE NEW G-19 CERTIFICATE OF  
FITNESS EXAM. ALL EXISTING G-19 CERTIFICATE OF  
FITNESS HOLDERS WILL BE REQUIRED TO TAKE THE NEW  
EXAM WHEN THEIR CURRENT CERTIFICATE OF FITNESS  
EXPIRES.**

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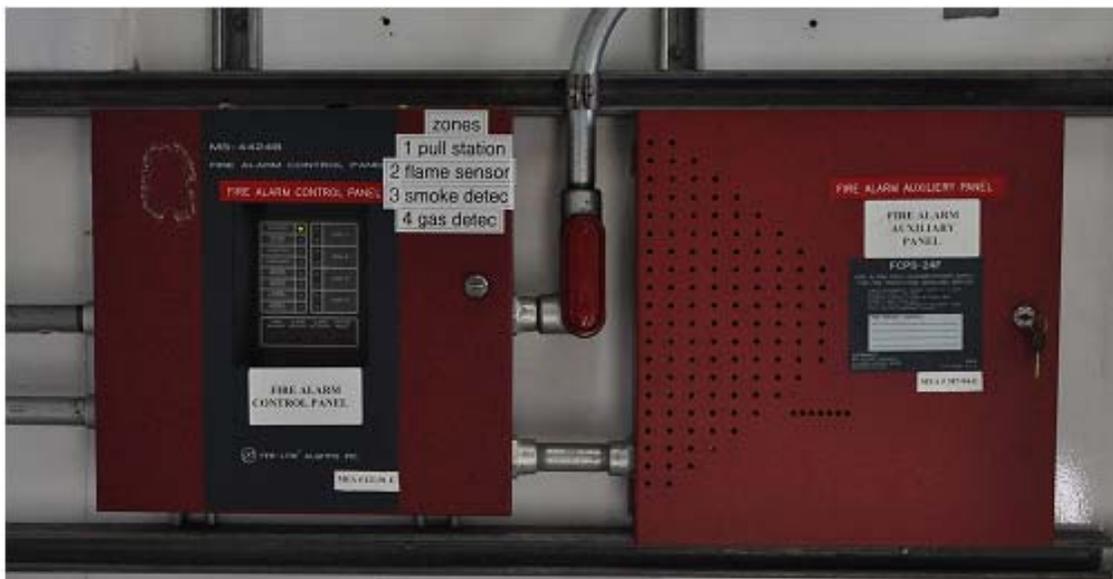
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## DEFINITIONS

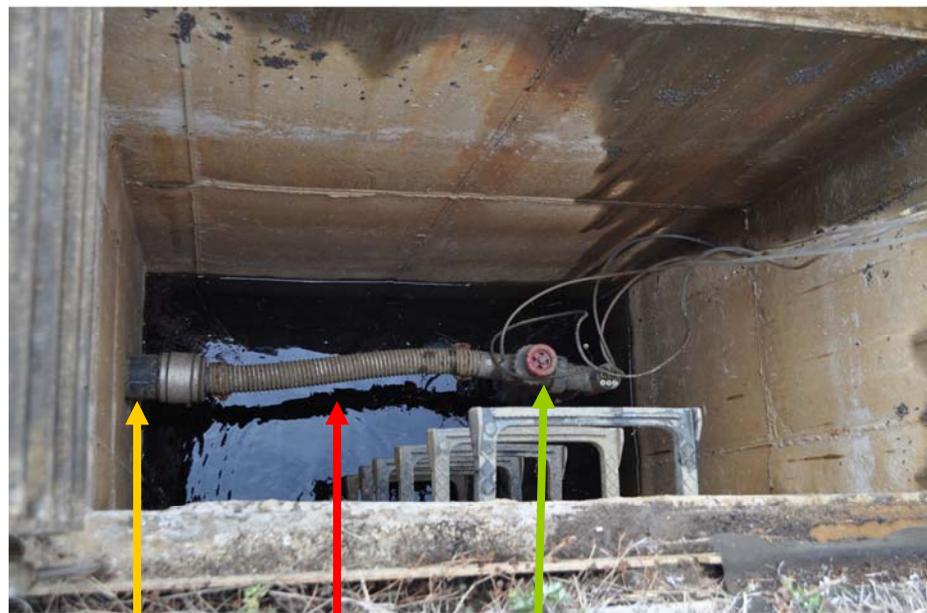
**Central Station / Central Monitoring Station** – The hub that contacts NYC Fire Department in case of emergency.

**Compressor** - A machine which compresses gas for the movement purposes into the piping distribution system.

**Control Panel** – Control Panel receives the signal from the sensors and transfers the signal to central monitoring station.



**Extraction Well** - A gas well is an excavation or structure created in the ground by digging, driving, boring, or drilling to access ground in underground aquifers.



Horizontal Pipe

Flexible Connection

Valve

Wells can vary greatly in depth (they can be anywhere from 30 feet to 80 feet deep), gas volume, and gas quality. Landfill penetrations are made by pipes of different lengths.

**Fire Alarm Initiating Device** – Fire Alarm Initiating Device is any of the following, or a combination of smoke detectors, heat detectors, UV detectors, IR sensors, pull station and duct detectors.

**Fracking** – Fracking is a relatively new drilling technology, which makes it possible to reach natural gas reserves. Hydraulic fracturing is the use of sand, water, and chemicals injected at high pressures to blast open shale rock and release the trapped gas inside.

**Flare and Blower Station** – Landfill gas is collected from decomposition of organic matter. The blowers collect the gas which is then burned in the flare station stack.

**Gas Detector** - A gas detector is a device which detects the presence of various gases within an area, usually as part of a safety system. This type of equipment is used to detect a gas leak and interface with a control system so a process can be automatically shut down. When activated, these methane detectors will emit audible and visible alarms in the control room.

**Heat Sensors** - A heat sensor is a fire alarm device designed to respond when the convected thermal energy of a fire increases the temperature of a heat sensitive element. Once the temperature reaches sensor rating the sensor will send a signal to the panel to sound the alarm.



**LEL (Lower Explosiveness Limit)** - The minimum concentration of a particular combustible gas or vapor necessary to support its combustion in air is defined as the Lower Explosive Limit (LEL) for that gas.

**Methane Gas Detection System** - A methane gas detection system that initiates audible and visible alarms in the control center

**Odorant room** – Methane gas is odorless, colorless and tasteless. Odorant room is an area where ethyl mercaptan (corrosive gas) is added for the purposes of detecting methane release.



**Smoke detector** - A listed device that senses visible or invisible particles of combustion.

**UV Detector / IR Sensor** – A UV detector is a device which uses photoelectric cells to detect the presence of UV rays. The Certificate of Fitness holder must ensure that UV detectors are properly operating. If the UV detectors are found to be malfunctioning the Certificate of Fitness holders must get in touch with company that services them and schedule a repair. IR sensors perform similar tasks; however they use different technologies. Infrared sensor is a device that detects an image using infrared radiation, similar to a common camera that forms an image using visible light. Instead of the 450–750 nanometer range of the visible light camera, infrared cameras operate in wavelengths as long as 14,000 nm.



# INTRODUCTION



Landfills are the largest source of U.S. anthropogenic methane emissions. Landfill methane is produced when organic materials (such as yard waste, household waste, food waste, and paper) are decomposed by bacteria under anaerobic conditions (in the absence of oxygen).

Methane (CH<sub>4</sub>) is the important component of landfill gas. The amount of methane that is produced varies significantly based on composition of the waste. Most of the methane produced in the landfills is derived from food waste, composite paper, and corrugated cardboard. The rate of landfill gas production varies with the age of the landfill.

The rate of methane production varies greatly from landfill to landfill depending on site-specific characteristics such as waste in place, waste composition, moisture content, pressure created by the excess waste, landfill design and operating practices, and climate. Unless captured first by a gas recovery system, methane generated by the landfill is emitted when it migrates through the landfill cover. During this process, the soil oxidizes approximately 10 percent of the methane generated, and the remaining 90 percent is emitted (flared).

Increased recycling and alternative waste disposal methods are contributing to a forecasted decline in landfill methane emissions, by slowing the rate of waste going into landfills. Primarily because of a rise

in recycling, the percent of waste going to landfills has been declining, and this percentage decline has offset the increase in total tons generated, roughly stabilizing the level of waste going into landfills.

Landfill gas utilization is a process of gathering, processing, and treating the methane gas emitted from decomposing garbage to produce electricity, heat, fuels, and various chemical compounds.

The recovery and use of methane from landfills can significantly reduce the overall emissions of greenhouse gases. Landfills are the largest anthropogenic source of methane in the U.S. There are a variety of ways that utilities can reduce overall emissions of methane from landfills.

Landfill methane can be collected by gas recovery systems, and it can then be used to generate electricity, as a fuel for nearby industrial purposes, or enriched and sold to gas pipelines.

These projects are popular because they control energy costs and reduce greenhouse gas emissions. They collect the methane gas and treat it, so it can be used for electricity or upgraded to pipeline-grade gas. These projects power homes, buildings, and vehicles.

Capture and use of landfill methane as fuel for electricity generation is done through the development of well fields and collection systems at the landfill. Collected methane can be used for on-site power generation or pipelined to a nearby existing generating station. Where electric generation is impractical, flaring is preferred over direct venting to reduce emissions and fire hazards.

**ALL THE METHANE RECOVERY LANDFILLS IN NEW YORK HAVE STOPPED ACCEPTING WASTE.**

## CERTIFICATE OF FITNESS RESPONSIBILITIES AND DUTIES

The facility shall be under the continuous personal supervision (24 hour, seven-day-a-week) by at least one (1) person holding a G-19 Certificate of Fitness for Supervision of Sanitary Landfill Methane Recovery Facilities.

**PLEASE NOTE: The G-19 Certificate of Fitness DOES NOT qualify the holder to PERFORM AND SUPERVISE FLAMMABLE GAS COMPRESSING (G-29), FIRE ALARM MAINTENANCE (S-98), and OPERATION OF A REFRIGERATING SYSTEM (Q-01) at a sanitary landfill methane recovery facility. Separate Certificates of Fitness are required for those job duties.**

JOB RESPONSIBILITY	COF	RELATED C OF F TESTS
PERFORM AND SUPERVISE FLAMMABLE GAS COMPRESSING	<b>G-29</b>	Safe Use, Handling, Storage and Compression of Flammable Gases With Pressure Above 6 PSI
FIRE ALARM MAINTENANCE	<b>S-97/S-98</b>	Fire Alarm Systems Inspection, Testing and Service Technician
OPERATION OF A REFRIGERATING SYSTEM	<b>Q-01</b>	Refrigerating System Operating Engineer

There are approximately 10 methane recovery landfill facilities in New York City. Some landfills are significantly different; however they all share similar type of mechanical and fire safety equipment. The differences include variations in land methane content, size of plants, and employee work practices. Please use this study material with these facts in mind.

The G-19 Certificate of Fitness holders are RESPONSIBLE for ensuring that ALL New York City Fire Department



regulations related to the safe use, handling and storage of methane gas are fully observed on the premises at all times.

The failure of G-19 COF holders to fulfill their duties can result in having their Certificate of Fitness revoked. Upon receiving their Certificates of Fitness, G-19 holders must maintain their Certificates of Fitness for their entire term of employment. If a G-19 COF holder changes his/her work location, the holder is NOT required to take another Certificate of Fitness exam. However; since G-19 is a site specific Certificate of Fitness, holders must file with FDNY to get a new COF card with correct address. Individuals that do not have a G-19 Certificate of Fitness and are transferring to a new location must provide a recommendation letter on an employer's letterhead with the correct work address prior to taking the G-19 Certificate of Fitness exam. A Certificate of Fitness card should be provided to FDNY representatives upon request. When applying for a G-19 Certificate of Fitness an employee must provide the FDNY with the employer's recommendation letter attesting to employees work experience.

## **SPECIFIC CERTIFICATE OF FITNESS RESPONSIBILITIES**

- Record operational data (eg. run times) on all mechanical equipment comprising the groundwater collection system and the landfill gas collection and flare station. **(See an example of daily, weekly, and monthly logs in the Appendix section of this study material.)**
- Performing routine maintenance (e.g. lubrication) on mechanical equipment as required.
- Visually observing the performance of mechanical equipment, and associated controls and instrumentation.
- Visually inspecting the condition of the landfill cover system.
- Visual inspection of the fire protection equipment

## **ANTICIPATED HAZARDS ASSOCIATED WITH CERTIFICATE OF FITNESS RESPONSIBILITIES**

- Potential for injury related to slip, trip and fall type accidents during the operator's walking tour of the site.
- Potential for injury/property damage related to the use of manual cranes/hoists when performing corrective maintenance on mechanical equipment.
- Potential for injury to workers' head, face, hands, feet and eyes, when inspecting and working on mechanical equipment, and when performing landscaping tasks.
- Potential for injury related to lock-out/tag-out (ex. Unwanted or unauthorized start-up of motorized equipment, electrocution, etc.), when performing as-needed corrective maintenance on mechanical equipment.
- Potential for exposure to various bio-hazards during the field sampling.

Some sanitary landfill methane recovery facilities may have more than 1 Certificate of Fitness holder working at the same time, just in case one of them gets injured on the job. The other individual can then seek medical attention. In the case where only 1 COF holder is on duty, he or she must have specific instructions on whom to contact in case of injury or other emergency. It is best to ask the supervisor about the proper protocol, as each methane recovery facility has a different one.

## **RESPONSIBILITY OF THE FACILITY OWNER**

It shall be the owner's representative/operators responsibility to maintain the sanitary landfill methane recovery facility and related systems. It is also the owner's responsibility to determine the

individual qualifications needed for the Certificate of Fitness holder to perform duties that are related to inspection, testing and maintenance of the facility. It is also the owner's responsibility to maintain a valid FDNY permit.

Records of all system inspections, tests, servicing and other maintenance required by the NYC Fire Code and NYC Fire Rules shall be maintained on the premises for a minimum of 3 years and made available for inspection by any department representative.

The facility owner shall assign an operations and maintenance employee to comply with the requirements of this study guide. In the absence of a specific designee, the owner shall be considered the impairment coordinator.

## FDNY PERMITS

### SITE-SPECIFIC PERMIT

Such permit authorizes the permit holder to recover methane from landfills and related processing, and to conduct an operation or maintain a facility at a specific premises or location, for which a permit is required by the NYC Fire Code.

A site-specific permit is valid for 12 months only. Every permit or renewal will require an inspection by the NYC Fire Department's Bulk Fuel Safety Unit and shall expire after 12 months.

Permits are not transferable and any change in occupancy, operation, tenancy or ownership must require that a new permit be issued. The Certificate of Fitness holder is responsible for ensuring that all fire safety regulations and procedures regarding the premises are fully observed. Permits and Certificates of Fitnesses shall be readily available and posted on the premises for inspection by Fire Department representatives.

### AN EXAMPLE OF FDNY PREMISES PERMIT

FIRE DEPARTMENT, CITY OF NEW YORK				BUREAU OF FIRE PREVENTION			
ACCOUNT NUMBER 77777777	TYPE 10	A.P. P	D.O. 12	ADM. CO. E284	ISSUANCE DATE 01/28/10	PERMIT EXPIRES 01/11	
PREMISES ADDRESS 1111 YORK ST STATEN ISLAND NY 11111				ACCOUNT NAME CARI & RENO			
ITEM CODE	SUB CODE	QTY	DESCRIPTION	FLOOR NO.	FEE		
338	00	01	Methane Recovery Operations	1	PAID		
PERMIT TYPE 1				ANNUAL FEE		PAID	
1-REGULAR 2-SUPPLEMENTAL 3-DUPLICATE		CARI & RENO 1111 YORK ST STATEN ISLAND NY 11111					
 2011012938				BY ORDER OF THE COMMISSIONER			

## **HOT WORK PERMIT**

- A Certificate of Fitness (G-60) is needed for conducting torch operations.
- A Certificate of Fitness (F-60) holder must be present to perform fire watch during hot work operations.
- A copy of an insurance policy is required as well for conducting hot work operations.
  
- FDNY temporary permits are required to conduct hot work:
  - (1) using oxygen and a flammable gas; or
  - (2) storing, using or handling any flammable gas in excess of 400 SCF.
  
- Hot Work Authorization (is NOT a FDNY permit) Requirements
  1. Hot work authorizations are to be issued daily and are required at all times for any welding, brazing/soldering, torch cutting, and spark production. A hot work authorization should be prepared by the responsible person for the subcontractor. The G-19 holder may serve as the responsible person or should ensure that such a person is designated to monitor the hot work operations. The G-19 Certificate of Fitness holder must have copies of all FDNY hot work permits and hot work authorizations secured on premises.
  2. Hot work operations are limited to the area and time specified in the hot work authorization.
  3. Subcontractors will identify responsible persons for hot work in Subcontractor Site Specific Safety Plans.
  4. A copy of the FDNY hot work temporary permit and hot work authorization are to be kept by the fire guard. Copies of completed permits will be maintained in the project files.
  5. Hot work authorization must be posted in the area where the work is taking place. It must be available for inspection by any representative of the FDNY during the performance of the work, and for 48 hours after the work is complete.
  6. A pre-hot work check shall be conducted by the responsible person prior to work to ensure that all equipment is safe and hazards are recognized and protected. A report of the check shall be kept at the work site during the work and made available for inspection by any representative of the FDNY.
  7. A hot Work Permit has to be obtained from CDA (Construction, Demolition and Abatements) Unit of FDNY.
  8. A pre-hot work check shall be conducted at least once per day.

## **WELDING**

(1) Welds of steel process piping shall be made by certified welders, and evidence of their certifications shall be filed with the FDNY. Piping welders shall be certified to the Department of Buildings by their

employers after qualifying under the ASME Boiler and Pressure Vessel Code, or API Standard 1104-1999.

Additionally, welders using oxygen and a flammable gas during torch operations must have a G-60 Certificate of Fitness. Fire Guards holding a Certificate of Fitness issued by the FDNY shall also be present at the time of torch operations.

(2) Upon completion of the installation, the owner or operator of the facility shall arrange to have a FDNY representative witness a hydro-test of all process piping (if needed – is based on the installation).

# DESIGN, INSTALLATION AND OPERATION OF METHANE GAS RECOVERY FACILITIES

Methane gas recovery facilities at sanitary landfills must be designed, installed, operated and maintained in compliance with the requirements of the NYC Fire Code, NYC Fire Rules, NYC Construction Codes and the NYC Electrical Code.

Design and installation documents for the facility, detailing the methane recovery process and fire protection systems, including a process flow diagram showing all vessels (also known as containers) and instrumentation, shall be filed with the NYC Department of Buildings and the FDNY's Bureau of Fire Prevention, together with supporting information and documentation.

## DESIGN AND INSTALLATION REQUIREMENTS

Pressure Vessels (Containers) shall be designed to comply with the ASME Boiler and Pressure Vessel Code. Manufacturer ASME data sheets for pressure vessels as well as the results of pressure tests (if required) shall be maintained on the premises and made available for inspection by any Fire Department representative.

### ELECTRICAL EQUIPMENT

(A) Electrical equipment within 25 feet of any process equipment shall be explosion-proof.

That includes the following:

- control center
- electric service
- overhead lights
- air handling equipment
- odorant room



(B) Electrical instrumentation shall be designed to provide for fail-safe operation.

- Instrumentation shall provide for fail safe design and operation.
- Refrigeration systems, if used, shall utilize a non-flammable refrigerant.
- The design and fabrication of the piping systems shall comply with ANSI B31.3-1980 “Chemical Plant and Petroleum Refinery Piping” except as modified by the Fire Department – City of New York.



## **GAS COLLECTION SYSTEMS**

Landfill gas is gathered from landfills through extraction wells. A typical gas extraction well is shown here.

Landfill gas can also be extracted through horizontal trenches instead of vertical wells. Both systems are effective at collecting gas.

Landfill gas is extracted and piped to a main collection header, where it is then sent to be treated or flared. A blower is needed to pull the gas from the collection wells to the collection header and further downstream.



## FLARE AND BLOWER STATION

If gas extraction rates do not warrant direct use or electricity generation, the gas can be flared off. One hundred m<sup>3</sup>/hr is a practical threshold for flaring. Flares are useful in all landfill gas systems, as they can help control excess gas extraction spikes and maintenance down periods. Flares can be either open or enclosed. Enclosed flares are typically more expensive, but they provide high combustion temperatures and specific residence times as well as limit noise and light pollution.



Landfill gas must be treated to remove impurities, condensate, and particulates. This process of purification is done at the flare and blower station.

The process and components of different flare stations do vary from facility to facility; however, common components usually include, extraction wells, headers, pipes, flaring station, sensors, control panels and so forth. Extraction wells and headers are connected with pipe to the flaring station. At the flaring station sensors measure the contents and amount of methane gas on each header.

Some flaring stations have a nitrogen or air operated shutdown valve. A modulating valve may also be present, as it is the valve that controls how much gas is taken from the landfill.

Blowers act as a vacuum that pull the gas from the landfill. A flame arrester, which is a honeycomb of metal, acts as a fail-safe mechanism. If the flame goes backwards, the flame arrester melts and an alarm will sound, and will simultaneously initiate a system shut-down. It is a preventive measure and may save lives.

The flaring station is always on, just in case there is gas that needs to be burned. If the gas is coming into a flare and blower station, it **MUST** be burned. If the flaring station is off and gas continues to be pulled in from extraction wells, it is then sent to the recovery system.

The flaring station has to be under constant maintenance. The lens/iris of the sensors has to be constantly cleaned, rates have to be recorded, and the control panel needs to be constantly checked and calibrated. These are just some of the many responsibilities the G-19 COF holder must perform. The flare has to be run at a minimum temperature; it is done by letting air in and out.

**BELOW IS A BRIEF SUMMARY OF HOW THE FLARE AND BLOWER STATION FUNCTION.**

The flare and blower process consists of turning on the blower. The blower then cleans the stack, after that the pilot gas gets released and pilot gets lit. Once the pilot gas gets lit and is at a certain temperature, the shutdown valve opens – lets the methane gas in. Blowers turn on automatically and start pulling in the methane gas. The pilot ignites it, and the flare is on.

The pathway of the gas in the FLARE and BLOWER STATION is:  
**HEADER → BLOWERS → FLAME ARRESTER → STACK**

## EMERGENCY SHUT DOWN OF THE FACILITY

In case of a fire emergency, the Certificate of Fitness holder shall comply with the following:

- 1) Initiate the emergency shutdown (ESD) of the landfill methane recovery facility
- 2) Call the Fire Department
- 3) Identify the source of the fire hazard
- 4) Direct firefighters to the hazard and assist as necessary

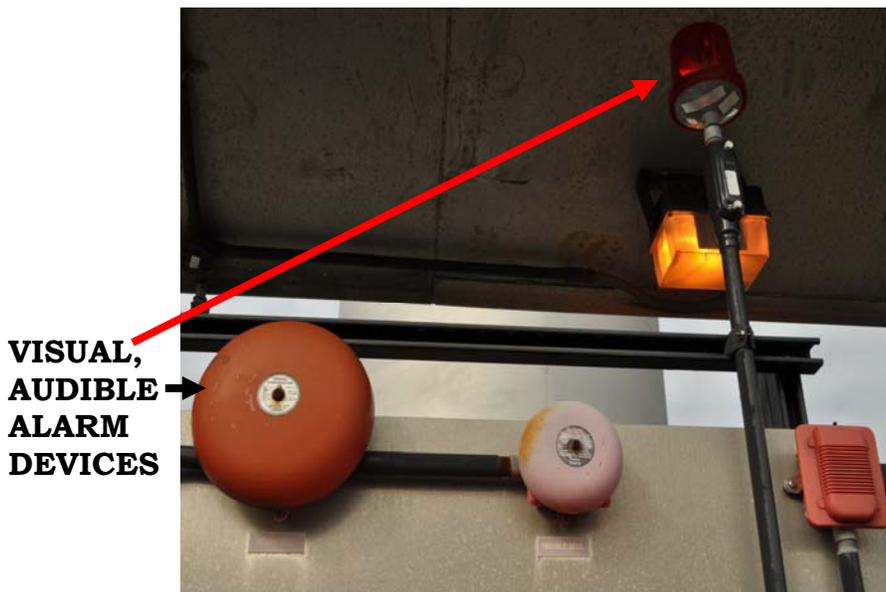
(A) The process equipment shall be provided with an emergency shut-down system capable of automatic and manual operation. The emergency shutdown system shall initiate upon the following activation:

- Manual activation of the system at the process control center (such as a fire, process equipment failure, etc).
- Activation of the fire detection system detectors located in the feed gas engine compressors area, or in other areas as determined by the Fire Department.



(B) Activation of the emergency shut-down system shall initiate:

- AUDIBLE and VISIBLE ALARMS at the control center
- an AUDIBLE ALARM outside the control center
- a VISIBLE ALARM at the field alarm panel
- automatic shut down of process equipment within two (2) minutes,
- followed by



depressurization of process piping to 100 psig or less with seven (7) minutes to 20 psig or less within twelve (12) minutes.



Instrument air compressors are not required to shut down upon activation of the emergency shut-down system.

(C) An EMERGENCY SHUT-DOWN can't be initiated by pulling the EMERGENCY SHUT-DOWN SWITCHES (Class 3 Box). The Certificate of Fitness holder MUST know where Emergency Shut-Down switches are located in their plant.

Should there be a need to release the gas from the system in case of emergency, the release shall only occur when all personnel are at a minimum distance from the system. System build-in timer usually allows 2 minutes for COF to investigate and to release the gas; personnel are required to abandon the facility to avoid breathing in the methane gas.

(D) One (1) or more emergency shut-down system abort switches, manual pull stations may be provided in the control center and/or in the field alarm panel. When activated within the first



**CLASS 3  
BOX**



## **ALARM SYSTEMS SHALL BE DESIGNED AND INSTALLED IN COMPLIANCE WITH NYC CODES AND REGULATIONS**

(A) A methane gas detection system that initiates audible and visible alarms in the control center at 25% LEL shall be provided throughout the landfill methane recovery facility.

Such a system shall have an audible alarm outside the control center and a visible alarm on the field alarm panel. The methane gas detection system may be interconnected with the emergency shut-down system, and is arranged to initiate such a shut down if gas detection reaches 50% of LEL.



**METHANE  
GAS  
DETECTOR**

### **METHANE GAS DETECTORS SHALL BE PROVIDED IN THE FOLLOWING LOCATIONS:**

- Feed gas compressor areas
- Feed gas intercool areas
- Vacuum compressor areas
- Vacuum module
- H.P. flash module
- Pretreatment module
- Solvent recovery system area
- Other area as determined by the FDNY.

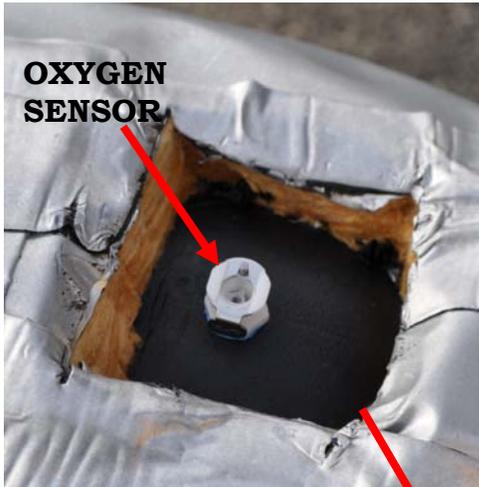
(B) An UV (Ultra-Violet) detectors and/or IR (Infra-Red) sensors shall be provided to protect the methane recovery and flaring plant area. The system shall initiate an audible and visible alarm at the control center, and an audible alarm on the field alarm panel. Activation of the fire detection system shall initiate the facility emergency shut-down system and shall transmit a fire alarm signal to a central monitoring station.

(C) At least one (1) manual fire alarm box (Class 3 box) shall be provided in the control center. At least one (1) additional manual fire alarm box shall be provided within the facility and near the facility entrance, which, if manually activated, shall transmit an alarm to a central monitoring station.

\*The Class 3 Box will only send a signal to an FDNY approved monitoring station. IT WILL NOT INITIATE AN EMERGENCY SHUT-DOWN.

(D) Process alarms for abnormal operating conditions shall be installed and in working order.

(E) Some methane recovery stations have oxygen sensor for monitoring the oxygen levels in the landfill gas. Levels above 5% of oxygen by volume are an indication of a hazard and should initiate a recovery system shut-down.



## YARD HYDRANT SYSTEM

A landfill methane recovery facility shall be provided with a yard hydrant system installed in conformance with the requirements of the construction codes, including the NYC Building Code and NYC Fire Code section 508.

The yard hydrant system shall be designed and installed in compliance with the following requirements:

(A) Hydrants shall be of a type complying with the requirements of the NYC Department of Environmental Protection and have Fire Department approved threads;



(B) The hydrant system piping shall be a minimum of eight (8) inches in diameter;

(C) Fire Department connections to the hydrant system piping shall be provided at one (1) or more approved locations;

(D) The system shall be supplied with water from a source capable of providing a minimum of 2,500 GPM (gallons per minute);

(E) A hydrant loop grid system shall be provided with block valves at one (1) or more approved locations for emergency and maintenance purposes;

(F) Hose reels and nozzles shall be provided at one (1) or more approved locations and shall be readily available for use; and



(G) Where required by the Fire Department, fire water monitors shall be provided at one (1) or more approved locations.

If a fire extinguishing system other than a sprinkler system is installed in an interior motor control room, it shall be of an approved type, and shall comply with NYC Fire Code Section 904 and the NYC Building Code.

### **HYDRANT TESTING**

Hydrants shall be tested annually to ensure proper functioning. Each hydrant shall be opened fully and water flowed until all foreign material has cleared.



Flow shall be maintained for not less than 1 minute. After the operation, dry barrel and wall hydrants shall be observed for proper drainage from the barrel. Full drainage shall take no longer than 60 minutes. Where soil conditions or other factors are such that the hydrant barrel does not drain within 60 minutes, or where the groundwater level is above that of the hydrant drain, the hydrant drain shall be plugged and the water in the barrel shall be pumped out.

Dry barrel hydrants that are located in areas subject to freezing weather and that have plugged drains shall be identified clearly as requiring pumping after operation.

### **MAINTENANCE**

Hydrants shall be lubricated annually to ensure that all stems, caps, plugs, and threads are in proper operating condition. Hydrants shall also be kept free of snow, ice, or other materials and protected against mechanical damage so that free access is ensured. After using a fire hydrant, a Certificate of Fitness holder should always secure the cap, roll and properly store the hoses, and check that the hydrant has drained properly.

## HOSE CABINETS

Hose cabinets must be painted red and provided with a white strip and number. The cabinet must be accessible at all times. Hoses, nozzles and other fire protection tools are to be kept in the hose cabinet. Hose connections are located in the hose cabinet. These connections will allow fire fighters to connect directly into the yard system.



The Certificate of Fitness holder should ensure that the hose cabinets are in good working order. All equipment inside should be inspected. The standard hose length is 50 feet. The hose cabinet must be closed with specific type of lock. The lock should be of a type that is easily broken in the event the key is not available.



Cabinets and enclosed compartments used to house portable fire extinguishers shall be clearly marked with the words FIRE EXTINGUISHER in letters at least 2 inches high. Cabinets and the compartments shall be readily accessible at all times.

The hose in the storage shall be kept out of direct

sunlight and in a well-ventilated location. The hose shall be stored only after it has been properly inspected, service-tested if required, cleaned, dried and rolled. The hose that is out-of-service for repair shall be properly tagged and kept separated from any hose that is in

storage and ready for service. To maximize the life of the hose, it should be stored in a ventilated area at temperatures between 32°F and 100°F. As per manufacturer's maintenance requirements, the hose should be wet-tested annually at a working pressure.

A HOSE NOZZLE is attached at the end of the hose. The nozzle is used to direct the stream of water from the hose. An example of a typical nozzle is shown in the picture below:



**Water Nozzle**

Nozzles at auxiliary hose stations shall be FDNY approved. Water spray nozzles shall be inspected and maintained by the G-19 COF holders to ensure that they are in place, continue to be aimed or pointed in the direction intended in the system design, and are free from external loading and corrosion. Where caps or plugs are required, the inspection shall confirm they are in place and free to operate as intended. Misaligned water spray nozzles shall be adjusted (aimed) by visual means, and the discharge patterns shall be checked at the next scheduled flow test.

### **FIRE EXTINGUISHERS INSTALLATION AND PLACEMENT**

Fire extinguishers must be located in conspicuous locations where they will be readily accessible and immediately available for use. These locations must be along normal paths of travel. Fire extinguishers having a gross weight 40 pounds or less must be installed so that the top of the extinguisher is not more than 5 ft above the floor. Hand-held fire extinguishers having a gross weight exceeding 40 pounds shall be installed so that their tops are not more than 3.5 feet above the floor. The clearance between the floor and the bottom of installed hand-held extinguishers shall not be less than 4 inches.

**IN OTHER WORDS, NO FIRE EXTINGUISHER IS ALLOWED TO BE ON THE FLOOR.**

## **CLASSES OF FIRES AND THE APPROPRIATE EXTINGUISHERS:**

**Class A** fires are caused by ordinary combustible materials (such as wood, paper, and cloth). A Class A fire extinguisher must use either the heat-absorbing effects of water or the coating effects of certain dry chemicals to extinguish a Class A fire.

**Class B** fires are caused by flammable or combustible liquids and gases such as oil, gasoline, etc. A Class B fire extinguisher, using the blanketing-smothering effect of oxygen-excluding media such as CO<sub>2</sub>, dry chemical or foam is most effective.

**Class C** fires involve live electrical equipment. These fires must be fought with Class C fire extinguishers that do not conduct electricity. Foam and water type extinguishers must not be used to extinguish electrical fires. After the power has been isolated from the electrical equipment, extinguishers for Class A or B fires may be used.

**Class D** fires are caused by ignitable metals, such as magnesium, titanium, and metallic sodium, or metals that are combustible under certain conditions, such as calcium, zinc, and aluminum. Generally, water should not be used to extinguish these fires.

A multi-purpose dry chemical fire extinguisher may be used to extinguish more than 2 Classes of fires. Examples of some fire extinguishers are shown on the next page.

Symbols may also be painted on the extinguisher. The symbols indicate what kind of fires the extinguisher may be used on. Examples of these symbols are shown on the next page. The symbol with the shaded background and the slash indicates when the extinguisher must NOT be used. The Certificate of Fitness holder must understand these symbols. All fire extinguishers should be kept in good working order at all times.

A Trash+Wood+Paper	B Liquids	C Electrical Equip.	For Class A types
			For all water-based types
A Trash+Wood+Paper	B Liquids	C Electrical Equip.	For Class A, B types
			(1) AFFF (2) FFFP
	B Liquids	C Electrical Equip.	For Class B, C types
			(1) Carbon dioxide (2) Dry chemical (3) Halogenated agents
A Trash+Wood+Paper	B Liquids	C Electrical Equip.	For Class A, B, C types
			(1) Halogenated agents (2) Multipurpose dry chemical

CLASSES OF FIRES	TYPES OF FIRES	PICTURE SYMBOL
<b>A</b>	Wood, paper, cloth, trash & other ordinary materials.	
<b>B</b>	Gasoline, oil, paint and other flammable liquids.	
<b>C</b>	May be used on fires involving live electrical equipment without danger to the operator.	
<b>D</b>	Combustible metals and combustible metal alloys.	

**Examples of different Fire Extinguishers**



**WHEELED POWDER FIRE EXTINGUISHER**



**PORTABLE FIRE EXTINGUISHERS**

## OPERATION INSTRUCTIONS FOR FIRE EXTINGUISHERS

# INSTRUCTIONS



### FIRE EXTINGUISHER INSPECTIONS AND MAINTENANCE

The extinguishers are required to be visually inspected monthly. The owner of the premises is responsible to designate a person to perform a monthly inspection. This inspection is a "quick check", that a fire extinguisher is available and will operate. It is intended to give reasonable assurance that the fire extinguisher is fully charged and operable.

#### “Quick Checks” are done by:

- Verifying that the fire extinguisher is in its designated place,
- Confirmed that it has not been actuated or tampered with and,
- That there is no obvious or physical damage or condition to prevent its operation.

#### The information of the monthly inspection record must include:

- the date the inspection was performed;
- the person performing the inspection, and
- those portable fire extinguishers found to require corrective action.

Recordkeeping must be either attached to the extinguisher or on an inspection checklist maintained on file. Labels or markings indicating fire extinguisher use, or classification, or both shall be placed on the front of the fire extinguisher.

**\*NOTE:** At least once per year, all fire extinguishers must be serviced by a FDNY approved company / W-96 Certificate of Fitness holder.

### MONTHLY INSPECTION TAG



Wheeled fire extinguishers must be periodically inspected to ensure that they are working properly. They should be tested according to the

schedule recommended by the manufacturer. All inspections should be recorded on the tag attached to the fire extinguisher. These inspections must be conducted by an authorized representative of the manufacturer. The extinguisher must be inspected to ensure that all extinguishers are fully charged. Defective extinguishers must be repaired or replaced. The name of the person conducting the inspections and the date must be recorded on the tag attached to the fire extinguisher. The Certificate of Fitness holder may also record these inspections in his/her log. Depending upon the material from which the extinguishers are made, they are subject to periodic hydrostatic testing.

### **MARKINGS**

Portable fire extinguishers shall not be obstructed or obscured from view. In rooms or areas in which visual obstruction(s) cannot be completely avoided, signs or other markings shall be provided to indicate the locations of portable fire extinguishers.

Wall hydrants and fire pump test headers located on the exterior of buildings shall be conspicuously marked to indicate their function. FDNY connections shall be marked as follows:

1. FDNY connections serving a standpipe system shall be provided with caps painted red, and shall have the word "STANDPIPE" in letters 1 inch high and 1/8 inch deep cast in the body or on a non-ferrous metal plate secured to the connections. They may also be mounted on the wall in a visible location, except that caps of FDNY connections used for combination standpipe and sprinkler systems shall be painted yellow and the words shall read "COMBINATION STANDPIPE AND SPRINKLER SYSTEMS."
2. FDNY connections serving a sprinkler system protecting an entire building or structure shall be provided with caps painted green and shall have the word "SPRINKLER" in letters 1 inch high and 1/8 inch deep cast in the body or on a non-ferrous metal plate secured to the connections. They may also be mounted on the wall in a visible location, except that caps of fire department connections used for combination standpipe and sprinkler systems shall be painted yellow and the words shall read "COMBINATION STANDPIPE AND SPRINKLER SYSTEMS."
3. FDNY connections serving a non-automatic sprinkler system shall have the entire connection painted silver.
4. FDNY connections serving a sprinkler system protecting only a portion of a building or structure shall have durable metal signs securely

fastened to, or above, the connection indicating the portion of the building or structure protected.

### **HAZARD IDENTIFICATION SIGNS AND MARKINGS**

Signs and markings required by Sections Hazard identification signs shall not be obscured or removed, shall be in English as a primary language or in symbols allowed by this code, shall be durable, and the size, color and lettering shall be acceptable to the commissioner.

### **EXAMPLES OF HAZARD MARKINGS**



Unless otherwise exempted by the Fire Commissioner, hazard identification signs as set forth in NFPA 704 for the specific material contained shall be conspicuously affixed on stationary containers and aboveground tanks and at entrances to locations where hazardous materials are stored, handled or used, including dispensing, in quantities requiring a permit, including locations where such materials are dispensed, and at such other locations as may be designated by the Fire Commissioner.

### **SOURCES OF IGNITION SUCH AS SMOKING, SHALL COMPLY WITH THE SECTION BELOW.**

It shall be unlawful to smoke in the following locations, and “No Smoking” signs shall be provided in English as a primary language.

**It should be prohibited:**

1. In rooms or areas where hazardous materials are stored or used in open systems in amounts requiring a permit.
2. Within 25 feet of outdoor hazardous material storage, handling and use areas, including dispensing areas.
3. In facilities or areas within facilities in which smoking has been entirely prohibited shall have “No Smoking” signs conspicuously placed at all entrances to the facility or area. Facilities or areas within facilities in which smoking is permitted in designated areas shall have signs indicating that smoking is permitted in designated areas only.
4. In rooms or areas where flammable or combustible hazardous materials are stored, handled or used.

**Warning markings**

Cabinets shall be clearly identified in an approved manner with red letters on a contrasting background to read: HAZARDOUS — KEEP FIRE AWAY.

Fire protection and other critical piping, as well as other processes, shall be identified in accordance with NYC Fire Code Chapters 9 and 27.

## ODORANT ROOM

(A) A *sprinkler system or other approved non-water fire extinguishing system* designed and installed in accordance with NYC Fire Code Chapter 9 and the NYC *Building Code* shall be provided for protection of a gas odorant room.

(B) A fire detection system shall be provided in the odorant room. Activation of the fire detection system shall cause the gas valves to close gas valves and initiate audible and visible alarms locally and in the control center.

(C) A flammable gas detection system shall be provided in the odorant room. Activation of the flammable gas detection system shall initiate audible and visible alarms locally and in the control center.

(D) The odorant room shall be equipped with absorbing or neutralizing equipment to prevent escape of any odorant to the atmosphere.

## LIGHTNING PROTECTION AND GROUNDING

(A) The highest structural steel, process vessels and columns shall be provided with lightning protection in accordance with the NYC *Electrical Code*.

(B) All process equipment and piping shall be electrically grounded.

*Flammable and combustible liquids*, in the gas recovery and treatment system, and in *stationary tanks*, shall be stored, *handled* and used in compliance with the requirements of NYC Fire Code Chapter 34 and the NYC Fire Rules. Solvents with low *flash points* and solvents used at a temperature above their *flash points* may be used only when *approved*.

*Natural gas* compressors shall be located outdoors, except that such compressors may be partially enclosed in light-weight noncombustible construction for protection against the weather, provided such enclosure is open at the top and bottom in an approved manner that provides for adequate ventilation and explosion venting.

The design and installation of any flaring system shall be *approved*.

## SECURITY

A fence constructed of noncombustible material shall be provided around the perimeter of the *facility*, at least 25 feet away from any process equipment.

At least two (2) means of fire apparatus access shall be provided to the methane gas recovery facility.

**SPACE HEATING SYSTEMS**

Only hot water space heating systems may be installed within the facility. The location of any space heating plant shall be *approved*.

**Note:** The Odorant Room is restricted to the utility company that works with the Methane Recovery Facility. COF holders are restricted from entering the Odorant Room.

# Appendix

## Daily Log (Example 1)

### LANDFILL GAS MANAGEMENT SYSTEM DAILY INSPECTION LOG

Date		Time	
Technician	Wind Speed/Direction		
Ambient Temperature (°F)		Barometric Pressure (in Hg)	
Weather		GEM I.D.	

FLARE STATION			
Blower in Service (circle)			
Blower Inlet Temp. (°F)		Demister Inlet Valve Position (% Open)	
Blower Vacuum (in. WC)		Demister Delta Pressure (in WC)	
Blower Discharge Temp. (°F)		Nitrogen Regulator Press. (psi)	
Blower Discharge Pressure (in. WC)		Nitrogen Tank Pressure (psi)	
Blower Outlet Valve Position (% Open)		Propane Regulator Press. (psi)	
Vacuum Control Transmitter (Digital %)		Propane Tank Pressure (psi)	N/A
Vacuum Control Valve Position (% Open)		Flame Arrestor Delta Pressure (in WC)	N/A

	Header #1	Header #2	Header #3	Header #4	Header #5	Header #6	Flare Inlet
Pipe Diameter (in.)	8	12	12	12	12	8	16
Valve Position (% Open)							
Temperature (°F)							
Gauge Vacuum (in. WC)							
Methane (% Vol)							
Carbon Dioxide (% Vol)							
Oxygen (% Vol)							
Vacuum (in. WC)							

Note: Header readings are taken on the field side of the valve.

ANALOG DATA MENU						
Flow - Chart Recorder (SCFM)			Top Flare Temp. (°F)			
Flow Rate (SCFM)			Middle Flare Temp. (°F)			
Flow Totalizer (1000 SCF)			Bottom Flare Temp. (°F)			
Landfill Vacuum (in WC)			Pilot Temperature (°F)			
Blower I/S Current (Amps)			Controlling Thermocouple			
Blower X Running Hours			Control Temperature (SP)			
Blower Y Running Hours			Control Mode			
Blower Z Running Hours			Area #1 LEL (Next to Blowers)			
LFG Oxygen (%)			Area #2 LEL (Next to Flare)			
Flow/Temp Chart Change (circle)	Yes	No	Print Daily Condensate Tank Report (check)			
Visible Smoke or emissions?	Yes	No	Flame Condition (Color and Stability)	Good	Bad	

<b>Comments:</b>

**KEY**  
 °F = degrees Fahrenheit  
 % Vol = percent by volume  
 psi = pounds per square inch

in WC = inches water column  
 in Hg = inches Mercury  
 SP = Set Point

SCFM = standard cubic feet per minute  
 SCF = Standard Cubic Feet  
 NA = Not Available

## Daily Log (Example 2)

### LANDFILL GAS MANAGEMENT SYSTEM DAILY INSPECTION LOG

<b>Date</b>		<b>Time</b>		<b>Technician</b>	
<b>Weather</b>		<b>Ambient Temp. (°F)</b>		<b>Wind Speed/Direction</b>	
				<b>Barometric Press. (in Hg)</b>	

HEADER DATA					
	Header A	Header B	Header C	Header D	Main Header
Methane (% Vol)					
Carbon Dioxide (% Vol)					
Oxygen (% Vol)					
Inlet Vacuum (in WC)					
Valve Setting (% Open)					Vac/Flow Valve
				Vac/Flow Control Valve (circle)	Manual    Auto

BLOWER STATION				FLARE STATION	
	% Open	inches WC	Temp (°F)	Flare Inlet Pressure (in WC)	Flame Arrestor Diff. Pressure (in WC)
Demister			//////////		
Blower Inlet		-		Aux Fuel Press. (in WC) - Natural Gas	
Blower Discharge		+		Nitrogen Pressure (psi) - Regulator	
Blower in operation (circle)				Nitrogen Pressure (psi) - Tank	

### ANALOG DATA MENU

Process Overview (YIC-1 From Main Menu Screen)		Flare Temperature	
Landfill Vacuum (in WC)		Top Flare Temp. (°F)	
Flow Rate (SCFM)		Middle Flare Temp. (°F)	
LFG Oxygen (%)		Bottom Flare Temp. (°F)	
Blower Current (Amps)		Controlling Thermocouple	
Flare Top Temp. (°F)		Louver Position (% Closed)	
Flare Middle Temp. (°F)		Control Temperature (SP)	
Flare Bottom Temp. (°F)		Control Mode	
Area LEL (%)			

Blower Data		Flow & Totalizer	
Blower 301 Current (Amps)		Current Flow (SCFM)	
Blower 301 Current (Hours)		Today's Total Flow (SCF)	
Blower 302 Current (Amps)		Total Flow (SCF)	
Blower 302 Current (Hours)			

7 Day Flow History		Resettable Flow	
Yesterday's Flow (SCF)		Resettable Total Flow (SCF)	
2 Days Ago Flow (SCF)		Reset Time	
3 Days Ago Flow (SCF)		Reset Date	
4 Days Ago Flow (SCF)			
5 Days Ago Flow (SCF)		<b>Area LEL</b> (Calibrated Detronics Methane Sensors)	
6 Days Ago Flow (SCF)		Area #1 LEL	
7 Days Ago Flow (SCF)		Area #2 LEL	

<b>Date and Time</b>	Date	Time	
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**KEY**

°F = degrees Fahrenheit  
 % Vol = percent by volume  
 psi = pounds per square inch

in WC = inches water column  
 in Hg = inches Mercury  
 SP = Set Point

SCFM = standard cubic feet per minute  
 SCF = Standard Cubic Feet  
 NA = Not Available

## Weekly/Bi-weekly Log

WEEKLY / BI-WEEKLY INSPECTION							
		<b>Date:</b>					
		<b>Time:</b>					
		<b>Technician:</b>					
<b>1. OPERATING BLOWER (Circle)</b>		<b>X</b>	<b>Y</b>	<b>X</b>	<b>Y</b>		
<i>1A</i>	Noise or Vibration	OK	Bad	OK	Bad		
<i>1B</i>	Measurable or Odiferous Gas Leaks	No	Yes	No	Yes		
<b>2. CONTROL PANEL – Motor Control</b>							
<i>2A</i>	Blower Running Light (Circle)	Off	On	Off	On		
<i>2B</i>	Blower 1 or 2 Current Alarm	Off	On	Off	On		
<i>2C</i>	High Motor Current Alarm	Off	On	Off	On		
<i>2D</i>	Alarm Shutdown Reset Button						
<b>3. CONTROL PANEL</b>							
<i>3A</i>	Panel Power Switch	Off	On	Off	On		
<i>3B</i>	System	Test	Off	Auto	Test	Off	Auto
<i>3C</i>	Blower Operation	Test	Off	Auto	Test	Off	Auto
<i>3D</i>	Blower Run Green Light	Off	On	Off	On		
<i>3E</i>	Purge System	Test	Off	Auto	Test	Off	Auto
<i>3F</i>	Purge On Green Light	Off	On	Off	On		
<i>3G</i>	Flare Pilot	Test	Auto	Test	Auto		
<i>3H</i>	Flame On Green Light	Off	On	Off	On		
<i>3I</i>	Auxiliary Fuel (Natural Gas)	Hand	Off	Auto	Hand	Off	Auto
<i>3J</i>	Flare Shutdown Valve	Open	Closed	Auto	Open	Closed	Auto
<i>3K</i>	Shutdown Valve Open Green Light	Off	On	Off	On		
<i>3L</i>	Condensate Tank Overfill Alarm Amber Light	Off	On	Off	On		
<i>3M</i>	Condensate Tank High Alarm Light	Off	On	Off	On		
<i>3N</i>	Condensate Tank Leak Alarm Light	Off	On	Off	On		
<i>3O</i>	Condensate Tank Alarm Test	Yes	No	Yes	No		
<i>3P</i>	Condensate Tank Power Green Light	Off	On	Off	On		
<i>3Q</i>	Condensate Tank Warning Amber Light	Off	On	Off	On		
<i>3R</i>	Condensate Tank Alarm Red Light	Off	On	Off	On		
<b>4. FLARE</b>							
<i>4A</i>	Flame Condition (Color & Stability)	Good	Bad	Good	Bad		
<i>4B</i>	Abnormal Burner Hot Spots	Yes	No	Yes	No		
<i>4C</i>	Unusual Sounds or Odors	Yes	No	Yes	No		
<i>4D</i>	Damper Motor Running	Yes	No	Yes	No		
<i>4E</i>	Manual Damper Position – Left Lever	Up	Down	Up	Down		
<i>4F</i>	Manual Damper Position – Right Lever	Up	Down	Up	Down		
<b>5. PIPING</b>							
<i>5A</i>	Piping General Condition						
<i>5B</i>	Inlet Valve Position		% Open		% Open		
<i>5C</i>	Gauges Operational	Yes	No	Yes	No		
<b>6. SITE CONDITIONS (Vandalism, Cleanliness)</b>							
<i>6A</i>		Good	Bad	Good	Bad		
<b>7. SUPPLEMENTAL NATURAL GAS VALVE</b>							
<i>7A</i>		Open	Closed	Open	Closed		
<b>8. NATURAL GAS METER READING (CUFT)</b>							
Temp compensated							
Non-compensated							

**Weekly/Bi-weekly Log (continued)**

DATE: \_\_\_\_\_ Technician: \_\_\_\_\_

<b>BI-WEEKLY INSPECTION GAS MANAGEMENT SYSTEM</b>											
<b>CONTROL PANEL – POWER &amp; ALARM</b>											
<b>Power Toggle Lever</b>	ON	OFF		<b>Alarm Light</b>	ON	OFF					
<b>Power Key</b>	ON	OFF		<b>Reset Button</b>							
<b>Power Light</b>	ON	OFF		<b>Emergency Stop</b>	IN	OUT					
<b>CONTROL PANEL – INDICATOR LIGHTS (Outside Door)</b>											
<b>Green Lights</b>						<b>Red Lights</b>					
<b>Purge Blower</b>	ON	OFF		<b>Purge Failure</b>	ON	OFF					
<b>Ignition Sequence</b>	ON	OFF		<b>Flare High Temp</b>	ON	OFF					
<b>Flame Prove</b>	ON	OFF		<b>Flame Failure</b>	ON	OFF					
<b>Inlet # 1 Open</b>	ON	OFF		<b>Flare Temp Low</b>	ON	OFF					
<b>Automatic Blocking Valve On</b>	ON	OFF		<b>Automatic Blocking Valve Failure</b>	ON	OFF					
<b>Blower No. 1 (Running Light)</b>	ON	OFF		<b>Blower No. 1 Failure</b>	ON	OFF					
<b>Blower No. 2 (Running Light)</b>	ON	OFF		<b>Blower No. 2 Failure</b>	ON	OFF					
<b>Blower No. 3 (Running Light)</b>	ON	OFF		<b>Blower No. 3 Failure</b>	ON	OFF					
				<b>High Blower Pipe Pressure</b>	ON	OFF					
<b>CONTROL PANEL SWITCHES (Inside Door)</b>											
<b>MODE SELECTION</b>						<b>MANUAL CONTROLS</b>					
<b>Control Mode</b>	MAN	OFF	AUTO	<b>Purge Blower</b>	OFF	ON					
<b>Blower No. 1</b>	MAN	OFF	AUTO	<b>Pilot Gas</b>	OFF	ON	IGNITE				
<b>Blower No. 2</b>	MAN	OFF	AUTO	<b>Inlet No. 1</b>	CLOSE	OPEN					
<b>Blower No. 3</b>	MAN	OFF	AUTO	<b>Mod. Valve Bypass</b>	OFF	ON					
<b>CONDENSATE TANK</b>											
<b>Tank Lights</b>	Good	Bad		<b>Tank Alarm Test</b>	Yes	No	<b>Printer Paper Roll</b>				
<b>ALARMS (From PLC Screen)</b>											
<b>Active Alarms</b>	Yes	No	<b>Alarm History Check</b>	Yes	No	<b>Cond. Overfill Light</b>	ON	OFF			
<b>Alarm:</b>											
<b>VERBATIM AUTO-DIALER</b>											
<b>Armed</b>	<b>Disarmed</b>		<b>Check Status</b>	Yes	No						
<b>BURNER CONTROL</b>											
<b>Power</b>	ON	OFF	<b>Flame</b>	ON	OFF	<b>Alarm</b>	ON	OFF	<b>Reset</b>	Yes	No
<b>VIGILANTE (CHECK IF LIGHT IS ON)</b>											
<b>CH<sub>4</sub> No. 1</b>	<b>CH<sub>4</sub> No. 2</b>	<b>O<sub>2</sub></b>		<b>O<sub>2</sub> Sample Pump-not needed</b>	<b>Power</b>	<b>All Flashing</b>					
<b>Oxygen Sensor Operation:</b>			Good	Bad	<b>Calibration Date</b>						
<b>LEL Sensors Operation:</b>			Good	Bad	<b>Calibration Date</b>						
<b>FLARE</b>											
<b>Flame Condition (Color &amp; Stability)</b>	Good	Bad	<b>Abnormal Burner Hot Spots</b>	Yes	No						
<b>Damper Motor Running</b>	Yes	No	<b>Unusual Sounds or Odors</b>	Yes	No						
<b>PIPING</b>											
<b>Piping General Condition</b>	Good	Bad	<b>Insulation Condition</b>	Good	Bad						
<b>Press. Gauges Operational</b>	Yes	No	<b>Temp. Gauges Operational</b>	Yes	No						
<b>SITE CONDITIONS (Vandalism, Cleanliness, Weeds)</b>									Good	Bad	

## Monthly Log (Example)

Month: \_\_\_\_\_, Year: \_\_\_\_\_

### Monthly Facility Safety Inspection

**Facility or Site:**

**Jobsite Address:**

**Reviewed by Supervisor Signature:** \_\_\_\_\_

**Inspected by:** \_\_\_\_\_ **Date:** \_\_\_\_\_

Yes	No	Worksite General	Comments
<input type="checkbox"/>	<input type="checkbox"/>	Safety signs/warnings posted where appropriate?	
<input type="checkbox"/>	<input type="checkbox"/>	Emergency phone #'s posted where they can be found easily?	
<input type="checkbox"/>	<input type="checkbox"/>	First Aid Kit available and adequately stocked?	
<input type="checkbox"/>	<input type="checkbox"/>	All work areas clean and orderly?	
<input type="checkbox"/>	<input type="checkbox"/>	Combustibles, scrap, debris, and waste removed and stored away from work area?	
		<b>Fire Protection</b>	
<input type="checkbox"/>	<input type="checkbox"/>	Fire suppression equipment inspection current?	
<input type="checkbox"/>	<input type="checkbox"/>	Fire extinguishers provided in adequate #, type and location?	
		<b>Exiting or Egress</b>	
<input type="checkbox"/>	<input type="checkbox"/>	All Doors marked and illuminated by reliable light source?	
<input type="checkbox"/>	<input type="checkbox"/>	Doors, passageways, or stairway appropriately marked?	
<input type="checkbox"/>	<input type="checkbox"/>	"Exit" sign lettering at least 5 inches high and 1/2 inch wide?	
		<b>Walkways</b>	
<input type="checkbox"/>	<input type="checkbox"/>	Aisles and passageways kept clear and clean?	
<input type="checkbox"/>	<input type="checkbox"/>	Pits and floor openings covered or guarded?	
		<b>Personal Protective Equipment (PPE)</b>	
<input type="checkbox"/>	<input type="checkbox"/>	Protective goggles or face shield provided and worn where there is a danger of flying particles or corrosive materials?	
<input type="checkbox"/>	<input type="checkbox"/>	Approved respirators provided for regular and emergency use as needed?	
<input type="checkbox"/>	<input type="checkbox"/>	PPE maintained in a sanitary condition and ready for use?	
<input type="checkbox"/>	<input type="checkbox"/>	Eye wash and quick drench shower within work area where employees are exposed to injurious materials?	
<input type="checkbox"/>	<input type="checkbox"/>	Hearing protection required when noise levels are exceeded?	
		<b>Self Contained Breathing Apparatus</b>	
<input type="checkbox"/>	<input type="checkbox"/>	Face piece in sealed bag?	
<input type="checkbox"/>	<input type="checkbox"/>	Lenses clear and clean?	
<input type="checkbox"/>	<input type="checkbox"/>	Cylinder pressure full?	
<input type="checkbox"/>	<input type="checkbox"/>	Straps, buckles, hardware in good condition?	
		<b>Ladders</b>	
<input type="checkbox"/>	<input type="checkbox"/>	Ladders inspected and maintained in good condition?	

## Monthly Log (Continued)

Month: \_\_\_\_\_, Year: \_\_\_\_\_

Yes	No	Rotating Equipment	Comments
<input type="checkbox"/>	<input type="checkbox"/>	Signs posted warning of automatic starting feature of the unit?	
<input type="checkbox"/>	<input type="checkbox"/>	Belt drive system totally enclosed?	
<input type="checkbox"/>	<input type="checkbox"/>	Coupling guards in place where needed?	
		<b>Compressed Gas Cylinders</b>	
<input type="checkbox"/>	<input type="checkbox"/>	Cylinders legibly marked to clearly indentify the gas contained?	
<input type="checkbox"/>	<input type="checkbox"/>	Compressed gas cylinders stored in areas which are protected from heat?	
<input type="checkbox"/>	<input type="checkbox"/>	Cylinders stored or transported in a manner to prevent them from creating a tripping, falling or rolling hazard?	
<input type="checkbox"/>	<input type="checkbox"/>	Valve protector caps always placed on cylinders when not in use?	
<input type="checkbox"/>	<input type="checkbox"/>	Bottles maintained with current hydro inspection dates?	
		<b>Lockout / Tagout Procedure</b>	
<input type="checkbox"/>	<input type="checkbox"/>	LOTO equipment available and inventoried?	
		<b>Confined Spaces</b>	
<input type="checkbox"/>	<input type="checkbox"/>	All permit required confined spaces properly identified and marked?	
		<b>Environmental Conditions</b>	
<input type="checkbox"/>	<input type="checkbox"/>	Work areas properly illuminated?	
<input type="checkbox"/>	<input type="checkbox"/>	Caution labels and signs used to warn of hazardous conditions?	
		<b>Flammable and Combustible Materials</b>	
<input type="checkbox"/>	<input type="checkbox"/>	Combustible materials stored in covered metal receptacles and removed from work area promptly?	
<input type="checkbox"/>	<input type="checkbox"/>	Approved containers and tanks used for storage and handling of flammable and combustible liquids?	
		<b>Hazardous Chemical Exposure</b>	
<input type="checkbox"/>	<input type="checkbox"/>	Containers labeled?	
<input type="checkbox"/>	<input type="checkbox"/>	Piping system clearly marked as to their contents?	
<input type="checkbox"/>	<input type="checkbox"/>	PPE provided, used and maintained where needed?	
		<b>Hazardous Substance Communication</b>	
<input type="checkbox"/>	<input type="checkbox"/>	MSDS readily available for each hazardous substance used?	
		<b>Electrical</b>	
<input type="checkbox"/>	<input type="checkbox"/>	Extension cords in use have the grounding conductor?	
<input type="checkbox"/>	<input type="checkbox"/>	Disconnecting switches and circuit breakers labeled to indicate their use or equipment served?	
<input type="checkbox"/>	<input type="checkbox"/>	Sufficient work space and access provided around all electrical equipment to provide safe operation and maintenance?	
<input type="checkbox"/>	<input type="checkbox"/>	Unused openings in electrical enclosures and fittings protected with appropriate covers, plugs, or plates?	
<input type="checkbox"/>	<input type="checkbox"/>	Each Motor disconnecting switch or circuit breaker located within sight of the motor control device?	
<input type="checkbox"/>	<input type="checkbox"/>	Employees who regularly work on or around energized electrical equipment or lines instructed in CPR methods?	

## Monthly Log (Continued)

Month: \_\_\_\_\_, Year: \_\_\_\_\_

Yes	No	Material Handling	Comments
<input type="checkbox"/>	<input type="checkbox"/>	Safe clearance for equipment through aisles and doorways?	
<input type="checkbox"/>	<input type="checkbox"/>	Aisles properly marked and clear?	
<input type="checkbox"/>	<input type="checkbox"/>	Motorized vehicles and mechanized equipment inspected daily or prior to use?	
<input type="checkbox"/>	<input type="checkbox"/>	Hooks and safety latches or other arrangements used when hoisting materials to prevent accidentally slip off?	
<input type="checkbox"/>	<input type="checkbox"/>	Securing chains, ropes, chokers, or slings adequate for the job?	
<input type="checkbox"/>	<input type="checkbox"/>	Shelves secure and constructed to withstand maximum designed storage weight?	
		<b>Hoist and Auxiliary Equipment</b>	
<input type="checkbox"/>	<input type="checkbox"/>	Rated load of hoist legibly marked and visible to the operator?	
<input type="checkbox"/>	<input type="checkbox"/>	Controls of hoist plainly marked to indicate the direction of travel or motion?	
<input type="checkbox"/>	<input type="checkbox"/>	Hoist and load bearing structures load tested and certified?	
		<b>Industrial Trucks and Forklifts</b>	
<input type="checkbox"/>	<input type="checkbox"/>	Industrial truck checklists in use and completed forms filed?	
		<b>Hand Tools and Equipment</b>	
<input type="checkbox"/>	<input type="checkbox"/>	All tools maintained and in good condition?	
<input type="checkbox"/>	<input type="checkbox"/>	Appropriate safety glasses, face shields, etc. used while using hand tools or equipment which might produce flying materials or be subject to breakage?	
		<b>Power Tools and Equipment</b>	
<input type="checkbox"/>	<input type="checkbox"/>	Grinders, saws and similar equipment provided with appropriate safety guards?	
<input type="checkbox"/>	<input type="checkbox"/>	Effective guards over belts, pulleys, and sprockets?	
		<b>Abrasive Wheel Grinders</b>	
<input type="checkbox"/>	<input type="checkbox"/>	Work rest used and kept adjusted within 1/8 inch of the wheel?	
<input type="checkbox"/>	<input type="checkbox"/>	Adjustable tongue on the top side of the grinder used and kept adjusted to within 1/4 inch of the wheel?	
		<b>Bulk Storage</b>	
<input type="checkbox"/>	<input type="checkbox"/>	Adequate secondary containment?	
<input type="checkbox"/>	<input type="checkbox"/>	Proper labeling?	
<input type="checkbox"/>	<input type="checkbox"/>	Fire Extinguishers available on fuel storage tanks?	
<input type="checkbox"/>	<input type="checkbox"/>	Visible signs of leaks?	