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RESPONSIBLE DEPT.	CONTENT CUSTODIAN				Approv	ED <b>B</b> Y		LEGACY NUMBER:
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## **1.0 INTRODUCTION**

#### 1.1 Purpose

The purpose of this document is to establish the minimum controls, safe work practices and training requirements that must be in place to protect personnel from potential exposure to Hydrogen Sulfide ( $H_2S$ ). This standard also covers minimum requirements for  $H_2S$  detection equipment at the Anacortes Refinery.

## 1.2 Scope

This procedure applies to Anacortes Refinery employees and contractors. All personnel working on Marathon property who are involved in work activities where there is potential for hydrogen sulfide exposure must comply with this procedure.

## 2.0 **REFERENCES**

## 2.1 Marathon Standards, Policies & Procedures

- HLT-2002, Hydrogen Sulfide Exposure Control Program
- RSP-1701-000, H<sub>2</sub>S Exposure Control Program Minimum Requirements

## 2.2 Government Regulations

- 29 CFR 1910.1000, Air Contaminants
- WAC 296-841, Air Contaminants

## 3.0 **DEFINITIONS**

The following definitions are applicable to this procedure.

Term	Description		
Breathing Zone	The area within a one-foot radius of the mouth and nose.		
Bump Test	Exposing a $H_2S$ sensor to a concentration of $H_2S$ known to be above the alarm point to make sure the sensor is working.		
Ceiling Limit	The OSHA Ceiling Concentration for $H_2S$ has been established at 20 ppm. The allowable time period for $H_2S$ above the ceiling but below the maximum peak is 10 minutes once, only if no other measurable exposure occurs		
Calibration	Introduction of a known concentration of $H_2S$ and adjustment of the instrument as needed for proper response and accurate reading.		
Docking Station	Equipment connected to network software designed to manage the day-to- day use of air monitoring equipment. Docking Stations hold and manage all air monitoring and exposure data.		
Fixed H <sub>2</sub> S Detector	A stationary monitoring device, normally located in a process area, sour gas facility, analyzer shelter, air intake stack or duct which detects high levels of $H_2S$ and displays a visual indication of $H_2S$ detected and audible warning.		

## Table 1 Definitions

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Hydrogen Sulfide (H<sub>2</sub>S)

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#### **Table 1 Definitions**

Term	Description
Hydrogen Sulfide (H <sub>2</sub> S)	A colorless and highly toxic gas that is also extremely soluble in water and liquid hydrocarbons. A natural component of crude oil and a by-product of some refinery processes. Depending on concentration, $H_2S$ can be explosive, flammable, or corrosive, and is dangerously reactive with other chemicals. $H_2S$ can be detected by its characteristic 'rotten egg' odor at low concentrations, but because it temporarily deadens the sense of smell, odor is not an adequate means of detecting $H_2S$ presence. CAS Registry number 7783-06-4.
Immediately Dangerous to Life and Health (IDLH)	The lowest atmospheric concentration of any toxic, corrosive or asphyxiating substance that poses an immediate threat to life or would cause irreversible adverse health effects or would impair an individual's ability to escape from a dangerous atmosphere. NIOSH IDLH for $H_2S$ is 100 ppm. <b>Note</b> : The IDLH value is based on the consequence that might occur after a 30-minute exposure, but every effort should be made to exit immediately.
Maximum Peak	OSHA Maximum Peak above the Ceiling is 50 ppm. The maximum peak concentration must not be exceeded more than once during an 8-hour shift.
Permissible Exposure Limit (PEL)	The maximum concentration of a chemical or material to which a worker may be exposed averaged over a period of time. OSHA PELs are usually expressed in 8-hour Time Weighted Averages (TWA) but PELs may also be TWA other than 8, STEL or Ceiling Limits.
Parts Per Million (PPM)	Concentration of substance per million parts of air
Short Term Exposure Limit (STEL)	Maximum concentration to which workers can be exposed to a chemical, material or physical agent averaged over a 15-minute period.
Personal H <sub>2</sub> S Monitor/Alarm	Gas detectors for personal use, small enough to be clipped onto exterior clothing. Personal alarms alert personnel to presence of the toxic gas they were designed to detect in the local atmosphere. They provide continuous, direct reading gas detection with visual and audible alarms, and are designed to be worn when working in locations where toxic gases might be released. The terms personal $H_2S$ monitor and personal $H_2S$ alarm are used interchangeably.

## 4.0 ROLES AND RESPONSIBILITIES

## 4.1 Health & Safety Department

The Health & Safety Department is responsible for maintaining this document and for providing training material to support  $H_2S$  training requirements. The Health & Safety Department also ensures docking stations and related equipment are maintained in good working condition. The Health & Safety Department maintains all monitor data and records within the iNET software. They also assist in personal  $H_2S$  alarm data management for all employee alarm events and notify individuals and their supervisors of any unreported alarms.

## 4.2 Supervisors

Supervisors ensure that H<sub>2</sub>S events are managed according to this procedure.

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#### 4.3 Employees

Employees ensure they are protected against  $H_2S$  related hazards by complying with this procedure. Report and communicate any safety or functional issues with equipment to the Health & Safety Department as soon as possible.

## 4.4 Contractors

Contractors are required to comply with the contents of this procedure. Contractors must provide each individual a personal H<sub>2</sub>S monitor with data-logging capabilities. Contractors are allowed to select personal H<sub>2</sub>S monitors of their choice as long as the manufacturers' recommendations are strictly adhered to. Contractors must have a way of downloading data from their monitors so that details of alarm events may be investigated.

## 5.0 HYDROGEN SULFIDE

Hydrogen sulfide ( $H_2S$ ) is a highly toxic, colorless gas. This gas is heavier than air and has the distinct odor of rotten eggs.  $H_2S$  can be detected by its characteristic 'rotten egg' odor at low concentrations, but because it can temporarily deaden the sense of smell at low concentrations, odor is not an adequate means of detecting  $H_2S$  presence. Its principal hazard is poisoning by inhalation.  $H_2S$  burns with a blue flame and produces sulfur dioxide, a very irritating gas with a pungent odor.

Because the sense of smell cannot be depended upon to detect hydrogen sulfide, a detector or monitor must be used for an accurate determination of the presence of gas, as well as its percentage in air.

H<sub>2</sub>S Concentrations of 20-150 ppm cause irritation of the upper respiratory tract, and if exposure is prolonged, pulmonary edema may result. An exposure to 500 ppm can result in headache, dizziness, excitement, staggering gait, diarrhea, and dysuria, followed sometimes by rapid breathing leading to a loss of breathing. Exposures of 800-1000 ppm may be fatal within seconds.

PPM H2S	Bodily Response		
5 - 10	Easily detectable, moderate odor of rotten eggs.		
10	Eye Irritation.		
50 - 100	Coughing, loss of sense of smell after 2-15 minutes.		
200 - 300	Eye inflammation and respiratory irritation.		
500 - 700	Loss of Consciousness, breathing stops, death.		
700 - 1,000	Rapid unconsciousness, breathing stops, death.		
1,000+	Immediate unconsciousness, breathing stops, death.		

Table 2	Bodily	Response	to H	l2 <b>S</b>	Concentrations
---------	--------	----------	------	-------------	----------------

H<sub>2</sub>S Exposure Limits:

- PEL 10 ppm
- STEL 15 ppm

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- PEL Ceiling 20 ppm
- PEL Maximum Peak 50 ppm
- IDLH 100 ppm

## 6.0 H<sub>2</sub>S HAZARD ASSESSMENT

#### 6.1 H<sub>2</sub>S Area Identification

The Anacortes Refinery has established areas in the refinery where  $H_2S$  may be present. The following sources of information are examples of criteria used to establish the  $H_2S$ areas in the plant: Process Safety Management Process Hazard Assessment (PHA) data, Process Safety Information, and personal  $H_2S$  monitoring results.

#### 6.2 Routine Air Monitoring

Surveys of work area atmospheres will be conducted during routine and turn-around operations in work areas where  $H_2S$  might be present. Surveys include area and source measurements with direct reading instruments and other air monitoring instruments and techniques.

Personal air monitoring must be performed to evaluate full-shift, short-term and peak exposures. Representative work shift and peak exposure concentration monitoring will be conducted on each job classification in each work area.

#### 7.0 PRECAUTIONS

The following precautions should be strictly observed whenever the presence of hydrogen sulfide is known or suspected:

- Maximum care should be taken to prevent the escape of H<sub>2</sub>S gas into the atmosphere (Ex: leaks, draining of equipment).
- Never attempt to determine the presence of gas by its odor. Before entering air suspected of containing hydrogen sulfide, make sure that air monitoring has been performed to determine whether or not the gas is present.
- Supplied Air is required when any work is being conducted (including Operators conducting Verification checks) on systems that are known to contain High H<sub>2</sub>S (such as: Acid Gas; Sour Water; Diesel Hydro Treater (DHT) Hydrogen; Vacuum Flasher Tail Gas; ROSE Solvent;). This includes opening the system for equipment prep by Operations, opening for troubleshooting by either Maintenance or Operations, opening to atmosphere, using bleeders to prime injection pumps.

**Note**: Approved engineered sample stations are exempt from supplied air.

## 8.0 FLARE LINES, FUEL GAS, SOUR WATER STRIPPERS & H<sub>2</sub>S LINE

Supplied Air is required to be worn, and the area must be properly barricaded anytime work is being conducted on systems that are known to contain High quantity/concentration  $H_2S$  (such as: Acid Gas, Sour Water, Diesel Hydro Treater (DHT) Hydrogen, Vacuum Flasher Tail Gas, and ROSE Solvent). Once the barricaded area is established, anyone entering the area must be wearing supplied air. Work may include opening the system for equipment preparation by Operations, opening for troubleshooting by either Maintenance or Operations, opening to atmosphere, and using bleeders to prime injection pumps.

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If supplied air was used to turn the blind closed, supplied air will be required to turn the blind open.

Exceptions that do not require supplied air:

- Sampling using engineered sample stations; Opening Fuel Gas system that is under negative draft (potential Furnace/Boiler Burner piping when under negative draft).
- A Full Face APR (respirator) with H2S cartridge (Acid gas) can be used in place of the systems listed above when the system is isolated, cleaned/purged and the volume is small. Examples include, but are not limited to changing a pressure gauge, removing a cap/plug, opening/verifying equipment for maintenance, and non-routine samples.
  - When using a Full Face APR with an acid gas cartridge, employees MUST wear their personal H<sub>2</sub>S meter at all times.
    - If the meter alarms, the system should be isolated and the employee must dock the meter.

## 9.0 PERSONAL PROTECTION

Properly calibrated and bump tested personal H<sub>2</sub>S monitors shall be worn by all employees and contractors in areas where "Essential PPE" is required. This includes all process areas, Tank Farm, Wharf/other loading areas, and the Flare area. The following exceptions apply:

- Non-Marathon truck or delivery drivers that are managed under an Automotive Permit or are making deliveries to non-process areas.
- Administrative or other personnel walking to and from the Maintenance Shops, Central Control Room, or Operations Shelters that can be accessed by roads not needing Automotive Permits.
- Personnel who enter an area where the concentration of H<sub>2</sub>S is or may be greater than 10 ppm AND are wearing a Pressure Demand SCBA or SAR are not required to wear their personal H<sub>2</sub>S Detector.

#### 9.1 Monitor Placement

Personal  $H_2S$  monitors must be worn in the breathing zone and outside of the outermost layer of clothing. The breathing zone is an area approximately one-foot square around the nose and mouth. Monitors must be worn so that they are likely to be seen and/or heard if the device alarms.

Suggested locations for the placement of the detector include:

- Shirt collar or clipped to pocket (i.e., sensor must be outside the pocket).
- Upper half of the shirt where the buttons are located.
- In cold weather, and when donning chemical protective clothing, the detector must be placed on the outermost layer of clothing.

Personal  $H_2S$  monitors may not be worn on the belt, on the hard hat (i.e., visible alarm indicator cannot be seen) or covered inside a shirt or coat pocket. Personal  $H_2S$  monitors MUST NOT be used for unit gas testing or for trying to locate an  $H_2S$  source. Atmospheric monitors (MX4 and MX6 testers with pumps) are available for this purpose.

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#### 9.2 Issuance to Employees

Personal H<sub>2</sub>S monitors are issued by the Health and Safety Department. Each employee is assigned to their own personal monitor by equipment serial number.

If an employee wishes to wear a 4-gas monitor in addition to their personal  $H_2S$  monitor, Industrial Scientific MX-4s are available for check out in the Safety Equipment Room. For after-hours equipment check-out, shift supervisors have access to the Safety Equipment Room.

## **10.0 PERSONAL MONITOR ALARMS**

#### 10.1 Response

Personal  $H_2S$  monitors have a low alarm set point of 10 ppm and a high alarm of 20 ppm. If a personal  $H_2S$  monitor goes into alarm:

- Assume that H<sub>2</sub>S is present and evacuate the area immediately.
- Evacuate the area upwind or crosswind, leaving the area in an orderly manner.
- Immediately report the event to Operations so that personnel can don fresh air and investigate the situation with a MX6 or MX4 multi-gas meter. A minimum of two SCBA-wearing responders are required for entry into a release zone.
- If an individual has any symptoms of H2S exposure, report to the Medical Clinic.
- Notify your supervisor.

Acknowledge and stop the alarm by pressing and holding down O button.

If possible, press O button and scroll though screens to note the peak  $\swarrow$  reading on the meter. If an individual was exposed to 50 ppm or greater H<sub>2</sub>S without respiratory protection, the individual must report to the Health Services Clinic and be protected from additional H<sub>2</sub>S exposure for the remainder of the shift. Refer to Injury Management and Reporting (R-11-006).

- **Note** : An individual must never return to the field without first acknowledging/ docking and stopping alarm on personal meter. This is equivalent to working without a  $H_2S$  meter.
- For exposures >50 ppm without respiratory protection, the employee shall be taken to the Medical Clinic for evaluation. The employee must also be protected from additional H<sub>2</sub>S exposure for the remainder of their shift using the methods below:
  - $\circ~$  Reassignment for the remainder of the shift to a job that would have limited exposure to H\_2S; or
  - Replacement by another qualified worker; or
  - $\circ$  Continuation of normal duties with the recognition that any job that has the potential for H<sub>2</sub>S exposure must be done in a Pressure Demand SCBA or SAR or by another qualified worker.

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- $\circ$  Operations must determine the most appropriate method(s) to ensure that the personnel who were exposed to 50 ppm H<sub>2</sub>S or greater are protected from additional H<sub>2</sub>S exposure for the remainder of that work shift.
- Dock the meter on docking station as soon as possible, so that data from the meter can be downloaded to iNET.
- Maintenance and contractor personnel shall not return to the unit until advised by Operations personnel that it is safe to do so.
- For exposures >100 ppm with Full Face APR (respirator) and H2S cartridges (Acid gas) protection, the employee **shall be taken to the Medical Clinic for evaluation.** The employee must also be protected from additional H<sub>2</sub>S exposure for the remainder of their shift using the methods below:
  - $\circ$   $\;$  Employee must be taken to the Medical Clinic for evaluation.
  - $\circ~$  Reassignment for the remainder of the shift to a job that would have limited exposure to H\_2S; or
  - o Replacement by another qualified worker; or
  - $\circ~$  Continuation of normal duties with the recognition that any job that has the potential for H\_2S exposure must be done in a Pressure Demand SCBA or SAR or by another qualified worker.
  - Operations must determine the most appropriate method(s) to ensure that the personnel who were exposed to 50 ppm  $H_2S$  or greater are protected from additional  $H_2S$  exposure for the remainder of that work shift.
  - Dock the meter on docking station as soon as possible, so that data from the meter can be downloaded to iNET.
  - Maintenance and contractor personnel shall not return to the unit until advised by Operations personnel that it is safe to do so.

If either exposure was while taking a sample from a sample station the reason for the exposure must be identified and mitigated to eliminate additional workers being exposed in the future. If the issue is not able to be resolved immediately a notification must be entered, and the sample station must be tagged as Fresh Air required to utilize. If the sample is necessary, the sample will need to be taken in fresh air until the issue is eliminated.

## 10.2 Reporting

Employees and Contractors shall report ALL personal  $H_2S$  alarm events to their supervisors for entry into our INTELEX. database.

- If the event involves a Marathon employee, the Supervisor is responsible for entry into the Intelex database for alarms greater than or equal to 20ppm.
  - This includes alarm events greater than or equal to 20ppm while using a Full Face APR with acid gas cartridge.
    - Supervisors should list the PPE worn when the Intelex is entered.
- If the event involves a contractor, the Contractor Sponsor is responsible for ensuring that the event gets entered into INTELEX.

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Per the incident categorization matrix in EHS-002, a personal  $H_2S$  alarm event must be classified as an incident, not a near miss. The category criteria for personal alarm monitors are as follows:

- Cat 0: Personal Alarm Monitor (PAM) false alarms (interference, cross sensitivity, dropped instrument) or alarm events which occur when proper respiratory protection is worn.
- Cat 1: Personal exposures to H2S without appropriate level of respiratory protection at or above 20 ppm and below the Acceptable Maximum Peak Limit (<50 ppm).
- Cat 2: Personal Exposures to H2S without appropriate level of respiratory protection at or above the H2S Acceptable Maximum Peak Limit (50 ppm).
- Cat 3: Personal exposure to H<sub>2</sub>S above the IDLH (>100 ppm) resulting in an actual SIF injury or multiple injuries to contractors, employees, and/or members of the general public.

The event report shall include sufficient detail about the event (e.g., location, activity being performed, monitor serial number, monitor peak reading) to support an efficient start to an investigation, if warranted. The report must also include serial number on the affected monitor so that the Health and Safety Department can include peak instrument readings in the INTELEX report. Contractors are responsible for getting downloaded monitor data from their personal H<sub>2</sub>S monitors to the contractor sponsor for entry into the INTELEX report.

#### 10.3 Follow-Up

The Health and Safety Department will periodically audit alarm downloads to ensure that personal alarm events are being reported.

## **10.4 False Alarms/Alarm Interference**

False alarms can occur due to sensor malfunction, interfering materials, or other causes. At no time shall it be assumed that an alarm is false. It must be investigated, verified and understood that an alarm is false before personnel can enter an area without PPE. Interfering alarms may still warrant additional follow-up with the Health and Safety Department with the use of multi-gas meters or colorimetric detector tubes.

The table below reflects the percent response provided by the H<sub>2</sub>S sensor in the Industrial Scientific Tango when exposed to a known concentration of an interfering gas.

Interfering Gas	H <sub>2</sub> S Sensor Response
Carbon Monoxide (CO)	1%
Hydrogen Sulfide (H <sub>2</sub> S)	100%
Sulfur Dioxide (SO <sub>2</sub> )	1%
Nitrogen Dioxide (NO <sub>2</sub> )	-24%
Chlorine (Cl <sub>2</sub> )	-17%
Chlorine Dioxide (ClO <sub>2</sub> )	No data available



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Interfering Gas	H <sub>2</sub> S Sensor Response
Hydrogen Cyanide (HCN)	10%
Hydrogen Chloride (HCl)	0%
Phosphine (PH <sub>3</sub> )	No data available
Nitric Oxide (NO)	-0.2%
Hydrogen (H <sub>2</sub> )	0.1%
Ammonia (NH <sub>3</sub> )	0%
Acetylene	0%
Ethyl Mercaptan	30%
Methyl Mercaptan	75%

## **11.0 MAINTAINING PERSONAL H<sub>2</sub>S MONITORS**

Docking stations detect when bump testing and calibration is required. In addition, docking stations perform troubleshooting and will download any alarms and all data each time the monitor is docked.

- The Tango style gas badge must be bumped and calibrated monthly, OR after any alarms occurring in the field. This style of gas badge has dual sensor technology that allows an extension of the bump test frequency.
- Personal H<sub>2</sub>S monitors must be inspected prior to use to ensure the sensor surface is free of dirt and debris.
- Personal H<sub>2</sub>S monitors must not be covered by anything, including clothing.

Industrial Scientific Tangos are battery powered. Replacement batteries may be obtained from the Safety Equipment Room or the Safety Department.

Any issues with bump testing, calibration or general operation of the  $H_2S$  monitors should be reported to the Health & Safety Department.

## 11.1 Activation

To turn on the Tango, hold the mode button for 3 seconds. Each of the alarm indicators (i.e., left LED, right LED, speaker, vibrating alarm, and backlight) is tested for onesecond. The monitor performs an internal self-check on all parts, including the sensors. At the end of the self-check, a confidence checkmark indicator is active at the top left of the screen indicating that all internal checks have passed.

**Note**: Any button will activate the backlight for 5 seconds.

## 11.2 Calibration

A calibration of the monitor is required at least once per month. A calibration may be performed by placing the monitor into one of the DSX docking stations available throughout the Anacortes Refinery. Refer to R-14-004 for additional calibration information. On a monthly basis, the IH will provide a report to Supervisors to ensure employees are docking their personal  $H_2S$  monitors as required.

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## 11.3 Alarm Acknowledgement

If a personal monitor goes into alarm, it will continue to alarm until the user

acknowledges the alarm by pressing and holding down the Obutton. Once safe to do so, the user must dock the meter on a docking station to ensure proper functionality, as well as to download alarm event details to iNET.

## 11.4 Peak Reading

The power button 0 on the Tango can be pressed to scroll through the operation mode loop screens. Press the power button to scroll through the different screens until you

see a screen with the peak symbol  $\bigwedge$ . This screen will give the peak reading on the instrument since it was last docked.

## **12.0 ENGINEERING CONTROLS AND WORK PRACTICES**

## **12.1 Engineering Controls and Work Practices**

The Anacortes Refinery uses engineering and safe work practice control measures to maintain employee exposure within the published exposure limits. Where exposures cannot be maintained below the published exposure limits, the refinery uses controls to reduce exposures to the lowest practical level and provides employees with appropriate respiratory protection.

Engineering Control Examples - Examples of engineering controls include exhaust hoods, vapor collection systems, and closed loop sample systems.

Work Practice Examples - Examples of safe work practices include equipment preparation by Operations (steaming, draining, flushing, scavenger chemicals, etc.), portable ventilation, and PPE (supplied breathing air).

## **12.2 Interim H<sub>2</sub>S Exposure Controls**

Interim measures may be required while engineering controls are being developed and implemented. Examples of interim measures include respiratory protection being used or area monitors being deployed in area.

## **12.3 Fixed H<sub>2</sub>S Detectors**

Fixed area  $H_2S$  monitors are located in multiple locations throughout the refinery. Many factors are taken into account when considering the locations of fixed  $H_2S$  monitors including, but not limited to:

• High H<sub>2</sub>S containing streams and equipment with history of H<sub>2</sub>S related incidents/ high leak potential/enclosed areas.

Monitors have both audible and visual alarms. These monitors are checked/calibrated quarterly.

False alarms can occur due to sensor malfunction, interfering materials, or other causes. At no time shall it be assumed that an alarm is false. It must be investigated, verified and understood that an alarm is false before personnel can enter an area without PPE.

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Interfering alarms may still warrant additional follow-up with the Health and Safety Department with the use of multi-gas meters or colorimetric detector tubes.

When a fixed  $H_2S$  alarm sounds, secure the task being performed and then leave the area immediately. If it is necessary to enter a contaminated area, wear an SCBA and use the buddy system. Do not attempt a rescue operation without wearing a SCBA and obtaining standby assistance.

Loop Number	Zone	Indoor/Outdoor	Location
09AT-9025	В	Indoor	Alky Fan Room
09AI-9847	В	Indoor	Alky Analyzer Shelter
09AI-9848	В	Indoor	Alky Analyzer Shelter.
22ALHX-1057A	В	Indoor	Ops Double Wide
03AT-3084	В	Indoor	Old CCU RIE
03ATX-3009	В	Indoor	New CCU Fan Room
05AT-5122	В	Outdoor	Amine 1
11AT-0460A	В	Outdoor	Amine 2
11AT-0460B	В	Outdoor	Amine 2
11AT-0460C	В	Outdoor	Amine 2
11AT-0460D	В	Outdoor	Amine 2
11AT-0460E	В	Outdoor	Amine 2
11AT-0460F	В	Outdoor	Amine 2
11AT-0460G	В	Outdoor	Amine 2
40AT-1000A	В	Indoor	CCR Fan Room
03AT-2080	В	Outdoor	Sour Water Strippers, E-382s
08AT-1172	С	Indoor	Flare Analyzer Shelter
08AT-1177	С	Indoor	Flare Analyzer Shelter
08AT-8844	С	Outdoor	Flare Area Monitor
08AT-8845	С	Outdoor	Flare Area Monitor
08AT-8846	С	Outdoor	Flare Area Monitor
08AT-8847	С	Outdoor	Flare Area Monitor
08AT-8848	С	Outdoor	Flare Area Monitor
08AT-8921	С	Outdoor	Flare Area Monitor
08AT-8922	С	Outdoor	Flare Area Monitor
08AT-8928	С	Outdoor	Flare Area Monitor
08A-1180	С	Indoor	Flare Bottle Shelter North
08A-1189	С	Indoor	Flare Bottle Shelter South
I40AT 1000A	E	Indoor	CCR (HVAC Room)
22ATX1065	A	Indoor	CR OPS Shelter
22ATX 1055	A	Indoor	CRUDE OPS Shelter
01AE 1024	A	Indoor	Old CNTL RM HVAC Room

#### Table 3 Fixed H<sub>2</sub>S Monitor Station Locations

ATTENTION: Printed copies should be used with caution.



Fixed area  $H_2S$  alarm events must be reported in IMPACT. The event report shall include sufficient detail about the event to support an efficient start to an investigation, if warranted.

## **13.0 AUDITING**

Anacortes Refinery periodically conducts audits of our H<sub>2</sub>S Exposure Control Program as part of our internal auditing process.

## **14.0 TRAINING**

All personnel receive initial awareness training about the hazards of  $H_2S$ , use and limitation of personal gas monitors, response to alarms and required safe work practices. Personnel working in or near process areas where  $H_2S$  is routinely present are trained annually thereafter through the MPC Hydrogen Sulfide WBT.

## **15.0 REVIEW AND REVISION HISTORY**

Revision #	Preparer	Date	Description
0	Mark Willand	10/31/2021	Reformatted and Numbered per Document Control Policy, R-63-001.
1	Michael Fazio	2/3/2023	Added Health Services data to page 7. Changed 'IMPACT' to 'INTELEX' throughout. Changed content custodian.
2	Michael Fazio	9/23/2023	<ul> <li>Page 7: 9.2 Reporting; If the event involves a Marathon employee, the Supervisor is responsible for entry into the Intelex database for alarms greater than or equal to 20 ppm.</li> <li>Page 8; 9.2 Reporting; Cat 1: Personal exposures to H2S without appropriate level of respiratory protection at or above 20 ppm and below the Acceptable Maximum Peak Limit (&lt;50 ppm).</li> <li>Updated Approver to Shannon Logan.</li> </ul>
3	Michael Fazio	2/20/2024	Updated paragraph 10.2 to include monthly reporting.
4	Trent Kies	7/25/2024	Added Section 8.0; Added additional H <sub>2</sub> S requirement; Added Intelex reporting requirement; Line-by-line review.