Air Quality Standard Permit for Marine Loading Operations

Effective June 30, 2021

(a) Applicability

This standard permit may be used to authorize stationary facilities, or groups of facilities, at a site that conducts marine loading operation (MLO) activities.

(1) Sources authorized in a registration under this standard permit must operate independently of other equipment at the site. Existing sources may be reauthorized in a registration if all emissions from the source (including current and increases) are included in the registration and meet the appropriate requirements. If future projects at the site result in a source no longer operating independently, the source shall no longer be authorized by this standard permit.

(2) This standard permit shall not relieve the owner or operator from complying with any other applicable provision of the Texas Health and Safety Code (THSC); Texas Water Code; rules of the Texas Commission on Environmental Quality (TCEQ or commission); or any additional state or federal regulations.

(3) This standard permit is limited to those facilities with air contaminants for which an effects screening level (ESL) can be obtained from the Toxicity Factor Database.

(4) Any project that constitutes a new major stationary source or major modification as defined in 30 Texas Administrative Code (TAC) § 116.12 (Nonattainment and Prevention of Significant Deterioration Review Definitions) shall not be authorized by this standard permit.

(5) This standard permit does not authorize an MLO that belongs to the Standard Industrial Classification (SIC) Codes 1311 (Crude Petroleum and Natural Gas), 1321 (Natural Gas Liquids), 4612 (Crude Petroleum Pipelines), 4613 (Refined Petroleum Pipelines), 4922 (Natural Gas Transmission), and 4923 (Natural Gas Transmission and Distribution).

(b) Definitions

The words and terms in this standard permit shall have the meanings listed in 30 TAC Chapter 116, Subchapter A (Definitions), unless the context indicates otherwise.

(c) Authorized Facilities and Activities

(1) Only the following facilities, groups of facilities, and activities, along with supporting infrastructure equipment and facilities, and may be included in the registration:

(A) gaseous or liquid loading and unloading into or from drums, totes, containers, International Organization for Standardization (ISO) containers, tanks, trucks, railcars, barges, or ships;

(B) storage tanks for gases and liquids;

(C) emergency engines, boilers, and heaters;

(D) control equipment, including Carbon Adsorption Systems (CAS), flares, vapor combustion units (VCU), and vapor oxidizers;

(E) fugitive components, including valves, pressure relief valves, pipe flanges and connectors, pumps, compressors, instrumentation and meters, natural gas driven pneumatic pumps, and other similar devices with seals that separate process and waste material from the atmosphere and the associated piping; and

(F) maintenance, startup, and shutdown (MSS) activities. MSS shall only include:

(i) management of sludge from pits, ponds, sumps, and water conveyances, use of aerosol cans, calibration of analytical equipment, carbon canister replacement, catalyst charging/handling, instrumentation/analyzer maintenance, meter proving, and replacement of analyzer filters and screens;

(ii) maintenance on water treatment systems (cooling, boiler, potable), soap and other aqueous based cleaners, and cleaning sight glasses;

(iii) pump repair/replacement, fugitive component (valve, pipe, flange) repair/replacement, filter repair/replacement, vessel repair/replacement, and meter repair/replacement;

(iv) tanks: standing idle, degassing, post-control degassing, cleaning, filling, and refilling;

(v) inert gas purging and draining, venting and refilling pumps, filters, meters, sumps, valves, vessels and piping;

(vi) pigging, purging, and pipeline clearing; and

(vii) vapor collection from the process using a vacuum truck or air mover.

(2) This standard permit authorizes emissions from the temporary facilities used to support planned MSS activities at permanent facilities, including vacuum trucks and control devices (CAS, flares, VCUs, and vapor oxidizers). Emissions from temporary facilities are authorized provided the temporary facility does not remain on the property for more than 12 consecutive months, is used solely to support planned MSS activities at the permanent facilities authorized under this standard permit and does not operate as a replacement for an existing authorized facility. Temporary control devices must follow the requirements for the permanent devices listed below and must be included in the registration.

(3) Planned MSS emissions directly associated with facilities authorized under this standard permit shall be represented in the registration.

(d) **Administrative Requirements**

(1) The owner or operator shall not begin construction or operation of facilities authorized under this standard permit without prior written notification from the TCEQ Executive Director.

(2) Any claim under this standard permit shall comply with:

(A) 30 TAC § 116.604(1) and (2) (Duration and Renewal of Registrations to Use Standard Permits);

(B) 30 TAC § 116.605(d)(1) and (2) (Standard Permit Amendment and Revocation);

(C) 30 TAC § 116.610(a)(2) through (6) (Applicability);

(D) 30 TAC § 116.611 (Registration to Use a Standard Permit);

(E) 30 TAC § 116.614 (Standard Permit Fees); and

(F) 30 TAC § 116.615 (General Conditions).

(3) For all changes listed within paragraphs (A) – (F) of this subsection, MLOs previously authorized by this standard permit must submit a new registration incorporating existing facilities and shall not begin construction or operation without prior written notification from the TCEQ Executive Director. A new registration and fee are required in accordance with 30 TAC § 116.611 and § 116.614 for the following projects:

(A) the addition of a new facility;

(B) a change in method of control of emissions;

(C) a change in the character of the emissions;

(D) a change resulting in an increase of concentration, as represented in the registration impacts analysis, at or beyond the property boundary for any air contaminant;

(E) an increase in the previously authorized emission rate of any air contaminant represented in the registration; or

(F) the addition of any new air contaminants.

(4) For any other change to the representations, the owner or operator shall submit a notification to the TCEQ Executive Director describing the change(s) no later than 30 days after the change.

(e) **Emission Limitations and Impacts Evaluations**

(1) All emissions estimates must be based on representative worst-case operations and planned MSS activities.

(2) Emissions shall be required to meet the following:

(A) For an air contaminant not currently authorized at a site, a new site without a current air authorization, or a site being entirely authorized under this standard permit, the evaluation of emissions following section (h), Table 1 must meet the following:

(i) The maximum predicted concentration at or beyond the property boundary must be less than the applicable National Ambient Air Quality Standards (NAAQS) de minimis level;

(ii) The maximum predicted concentration at or beyond the property boundary must be less than or equal to the applicable State Property Line Standards; and

(iii) The maximum predicted concentration at or beyond the property boundary must be less than or equal to the applicable ESL.

(B) For an air contaminant previously authorized at a site prior to the submittal of this standard permit registration, the evaluation of emissions following section (h), Table 1 must meet the following:

(i) The maximum predicted concentration at or beyond the property boundary must be less than the applicable NAAQS de minimis level;

(ii) The maximum predicted concentration at or beyond the property boundary must be less than the applicable State Property Line Standards de minimis level; and

(iii) The maximum predicted concentration at or beyond the property boundary must be less than or equal to 10 percent of the applicable ESL.

(3) Air quality impacts evaluations must be completed on a contaminant-by-contaminant basis for any emissions resulting from an MLO. Compliance with NAAQS; state standards for net ground-level concentrations (State Property Line Standards); and hourly ESLs and annual ESLs for any emissions that do not have a federal or state ambient air standard shall be demonstrated beginning at the nearest property line.

(4) Air quality impacts shall meet the requirements of section (h), Table 1. Additionally, the following requirements apply:

(A) The ESL for the air contaminant shall be obtained from the Toxicity Factor Database.

(B) If the benzene content in crude oil or any grade of gasoline processed at the MLO is 1 percent by weight or greater, it shall be evaluated as an individual air contaminant under section (e).

(C) Methyl tert-butyl ether (MTBE) content in any grade of gasoline processed at the MLO shall be evaluated as an individual air contaminant under section (e).

(D) Distance measurements shall be determined using the shortest corresponding distance from any emission point, vent, or fugitive component to the nearest property line.

(E) Emission impact in section (h), Tables 2a - 5f must be used in accordance with the limits and descriptions in section (h), Table 1.

(5) If combining emission rates from multiple sources into one enforceable limitation, the worst-case impacts from the combined sources must be evaluated.

(f) **General Requirements**

(1) Monitoring data generated in accordance with section (h) (Operational Requirements), shall be used to demonstrate compliance with representations made in the registration, including emissions estimates.

(2) All emission estimation methods must be consistent with protocols established by the commission or promulgated in federal regulations (New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAP)). Where control of emissions is relied upon to meet section (e) (Emission Limitations and Impacts Evaluations), control device monitoring is required.

(3) Initial performance testing, monitoring, recordkeeping, and reporting shall demonstrate initial and continuous compliance with the representations made in the registration as required in section (g).

(4) Chemical Accident Prevention Provisions in Title 40, Code of Federal Regulations (40 CFR) Part 68 must be followed if the facilities handle a listed substance exceeding the applicable threshold. If 40 CFR Part 68 is applicable, a Risk Management Plan (RMP) must be maintained on-site and a copy must be submitted to the TCEQ Regional Office prior to the start of operation.

(5) All records required by this standard permit:

(A) shall be maintained in written or electronic form;

(B) shall be readily available to the agency or local air pollution control program with jurisdiction upon request;

(C) shall be kept at the facility;

(D) may be used to demonstrate compliance, including but not limited to federal recordkeeping or testing requirements, if the other requirements are at least as stringent as the associated requirements in section (g); and

(E) will suffice for demonstrating compliance when the documentation is already being kept for other purposes.

(6) Emissions from the facility may not cause a nuisance per 30 TAC § 101.4 (Nuisance).

(A) If compliance with 30 TAC § 101.4 so requires, a new registration and fee shall be submitted with proposals for additional control of nuisance-causing emissions either through process controls or additional emission controls.

(g) **Operational Requirements**

(1) All facilities that have the potential to emit air contaminants must be maintained in good working order and operated properly during facility operations. Each owner or operator shall establish and maintain a program to replace, repair, and/or maintain facilities to keep them in good working order. The minimum requirements of this program shall include:

(A) compliance with manufacturer's specifications and recommended programs applicable to equipment performance and effect on emissions, or alternatively, an owner or operator developed maintenance plan for such equipment that is consistent with good air pollution control practices;

(B) routine inspection of all equipment; and

(C) replacement and repair of equipment on schedules that prevent equipment failures and maintain performance.

(2) All facilities shall be operated at least 25 feet from any property line. This distance limitation does not apply to marine loading facilities located on state waters. Marine loading activities occurring on state waters are considered part of the property. The property line is assumed to extend 25 meters from the marine vessel located on state waters from which the loading activities are occurring.

(3) All facilities must meet the minimum discharge parameters in section (h), Table 6.

(4) A continuous hydrogen sulfide (H_2S) monitoring system shall be installed in a portion of the fuel gas system common to the fuel gas combustion devices authorized by this standard permit. The units shall be operated in accordance with the fuel sulfur monitoring requirements of 40 CFR § 60.105 (Monitoring of Emissions and Operations).

(5) This standard permit does not authorize the use of any halogenated compound when emissions are routed to a thermal control device.

(6) **Initial Determination of Compliance**

(A) Stack sampling and other testing shall be performed as required to establish the actual pattern and quantities of air contaminants being emitted into the atmosphere from any VCU, vapor oxidizer, boiler, and heater authorized by this standard permit to demonstrate compliance with any emission rate and destruction and removal efficiency (DRE) or outlet concentration represented in the registration. For boilers and heaters with a design heat input capacity less than 40 million British Thermal Units per hour (MMBtu/hr), testing is not required. The owner or operator is responsible for providing sampling and testing facilities and conducting the sampling and testing operations at their expense. Sampling shall be conducted in accordance with the appropriate procedures of the TCEQ Sampling Procedures Manual and the United States Environmental Protection Agency (EPA) Reference methods. The purpose of the pretest meeting is to review the necessary sampling and testing procedures, to provide the proper data forms for recording pertinent data, and to review the format procedures for the test reports. The TCEQ Regional Office must approve any deviation from specified sampling procedures.

(i) The appropriate TCEQ Regional Office shall be notified no less than 45 days prior to sampling. The notice shall include the:

(I) proposed date for pretest meeting;

(II) date sampling will occur;

(III) type of sampling equipment to be used;

(IV) method or procedure to be used in sampling;

(V) description of any proposed deviation from the sampling procedures specified in this standard permit or TCEQ/EPA sampling procedures; and

(VI) procedure/parameters to be used to determine worst case emissions.

(B) Air contaminants emitted from the VCU and vapor oxidizer to be tested for include nitrogen oxides (NO_x), volatile organic compounds (VOC), carbon monoxide (CO), sulfur dioxide (SO_2), and oxygen (O_2). Air contaminants emitted from the boilers and heaters to be tested for include NO_x and CO.

(C) Sampling shall occur within 60 days after achieving the maximum operating rate, but no later than 180 days after initial startup of the facilities and at such other times as may be required by the TCEQ Executive Director. Requests for additional time to perform sampling shall be submitted to the appropriate TCEQ Regional Office.

(D) The facility being sampled shall operate at maximum operating rates represented in the registration during stack emission testing. Operating rates and any other primary operating parameters that affect the emission rate shall be monitored and recorded during the stack test. Any additional parameters shall be determined at the pretest meeting and shall be stated in the sampling report. Some operational requirements and parameter limits may be waived during stack testing performed if the proposed requirement/parameter range is identified in the test notice specified in paragraph (g)(6)(A) and accepted by the TCEQ Regional Office. Maximum allowable emission rates and emission control requirements are not waived and still apply during stack testing periods.

(E) Copies of the final sampling report shall be forwarded to the following offices within 60 days after sampling is completed. Sampling reports shall comply with “Chapter 14, Contents of Sampling Reports” of the TCEQ Sampling Procedures Manual. The reports shall be distributed as follows:

(i) One copy to the appropriate TCEQ Regional Office.

(ii) One copy to each local air pollution control program.

(F) Sampling ports and platform(s) shall be incorporated into the design of the source stack according to the specifications set forth in “Guidelines for Stack Sampling Facilities (Formerly Chapter 2)” of the TCEQ Sampling Procedures Manual. Alternate sampling facility designs must be submitted for approval to the TCEQ Regional Office.

(7) **Opacity Requirements**

(A) During routine operations, opacity of emissions from engines, boilers, and heaters shall not exceed five percent averaged over a six-minute period. During periods of MSS operation, the units shall not exceed 15 percent averaged over a six-minute period. Compliance shall be demonstrated using the following procedures:

(i) Visible emission observations shall be conducted and recorded at least once during each calendar quarter unless the emission unit is not operational during that entire calendar quarter.

(ii) These observations shall be made by first observing for visible emissions while each facility is in operation. Observations shall be made at least 15 feet and no more than 0.25 miles from the emission point(s). Up to three emission points may be read concurrently, provided that all three emission points are within a 70-degree viewing sector or angle in front of the observer such that the proper sun position (at the observer's back) can be maintained for all three emission points. A certified opacity reader is not required for these visible emission observations.

(iii) If no visible emissions are present during the observations conducted as specified in paragraph (g)(7)(A), then compliance with the opacity limit will have been demonstrated.

(iv) If visible emissions are present, one of the following shall be performed within 24 hours:

(I) assume that an exceedance of the applicable opacity limit has occurred; or

(II) conduct and record an opacity observation as determined by 40 CFR Part 60,

Appendix A, Reference Method 9 to determine if an exceedance of the opacity limit has occurred.

(8) **Loading Operations**

(A) All loading operations are limited to the materials, rates, throughputs, and collection efficiencies as represented in the registration. Rolling 12-month facility throughput records shall be updated on a monthly basis for each material loaded.

(B) All loading shall be submerged, or bottom loaded.

(C) Loading of materials with vapor pressure greater than or equal to 0.5 pounds per square inch absolute (psia) at 95 degrees Fahrenheit (°F) or the loading temperature, whichever is higher, shall be vented to control and meet the specific control device requirements.

(D) An emissions record shall be maintained and updated monthly which includes calculated emissions of VOC from all loading operations over the previous rolling 12-month period. The record shall include the loading spot, control method used, collection efficiency, quantity loaded in gallons, name of the material loaded, vapor molecular weight, liquid temperature °F, liquid vapor pressure at the liquid temperature in psia, and material throughput for the previous month, and rolling 12 months to date. Records of material temperature are not required to be kept for material loaded from unheated tanks which receive materials that are at or below ambient temperatures.

(9) **Marine Loading**

(A) Marine loading activities related to or dependent upon MLO that occur over land shall be operated at least 25 feet from any property line. Marine loading activities occurring over state waters are considered to be occurring on property and the property line is assumed to extend 25 meters from the vessel.

(B) If marine vessel loading is voluntarily controlled or marine vessels are loaded with materials with vapor pressure greater than or equal to 0.5 psia at 95°F or the loading temperature, whichever is higher, a vapor collection system must be properly connected, and the entire collection system must be working as designed prior to any loading activity occurring.

(C) For loading of non-inerted marine vessels (inland barges) loading materials with vapor pressure greater than or equal to 0.5 psia at 95°F or the loading temperature, whichever is higher, the following apply:

(i) Before loading a marine vessel with a VOC which has vapor pressure greater than or equal to 0.5 psia at 95°F or the loading temperature, whichever is higher, a blower system shall be installed to produce a vacuum in non-inerted marine vessels during all loading operations. A pressure/vacuum gauge shall be installed on the suction side of the loading blower system adjacent to the barge being loaded to verify a vacuum in that vessel. Loading shall not occur unless there is a vacuum of at least 1.5-inch water column being maintained by the vacuum-assist vapor collection system when loading barges. The vacuum shall be recorded every 15 minutes during loading.

(ii) Before loading a marine vessel with a VOC which has vapor pressure greater than or equal to 0.5 psia at 95°F or the loading temperature, whichever is higher, the owner or operator of the marine terminal shall verify that the marine vessel has passed an annual vapor tightness test as specified in 40 CFR § 63.565(c) (Test Methods and Procedures) (September 19, 1995) or 40 CFR § 61.304(f) (Test Methods and Procedures) (October 17, 2000) within the previous 12 months.

(D) For loading VOC, which has vapor pressure greater than or equal to 0.5 psia at 95°F or the loading temperature, whichever is higher, onto inerted marine vessels (ships or ocean-going barges), the following apply:

(i) Before loading begins, the owner or operator of the marine terminal shall verify that the marine vessel has passed an annual vapor tightness test as specified in 40 CFR § 63.565(c) (September 19, 1995) or 40 CFR § 61.304(f) (Test Methods and Procedures) Standards for Compliance Date Extension, (October 17, 2000) within the previous 12 months and received a recent, completed Standard Tanker Chartering Questionnaire form (Q88) or equivalent.

(ii) The pressure at the vapor collection connection of an inerted marine vessel must be

maintained such that the pressure in a vessels' cargo tanks does not go below 0.2 pounds per square inch gauge (psig) or exceed 80 percent of the lowest setting of any of the vessel's pressure relief valves. The lowest vessel cargo tank or vent header pressure relief valve setting for the vessel being loaded shall be recorded. Pressure shall be continuously monitored while the vessel is being loaded. Pressure shall be recorded at fifteen-minute intervals.

(iii) During loading, the owner or operator of the MLO or of the marine vessel shall conduct audio, visual, olfactory (AVO) checks for leaks within the first hour of loading and at least once every eight hours thereafter for onshore equipment and on board the ship.

(I) If a liquid leak is detected during loading and cannot be repaired immediately (for example, by tightening a bolt or packing gland), then the loading operation shall cease until the leak is repaired.

(II) If a vapor leak is detected by sight, sound, smell, or hydrocarbon gas analyzer during the loading operation, then a "first attempt" shall be made to repair the leak. Loading operations need not be ceased if the first attempt to repair the leak is not successful provided that the first attempt effort is documented by the owner or operator of the marine vessel, and a copy of the repair log is made available to a representative of the marine terminal.

(III) If the attempt to repair the leak is not successful, the company must cease loading operations unless the registration represents a collection efficiency of 99 percent in the emission representations.

(IV) Date and time of each inspection shall be noted in the operator's log or equivalent. Records shall be maintained of all repairs and replacements made due to leaks.

(E) In addition to the recordkeeping requirements of subsection (g)(8), the following additional barge and ship loading records shall be kept:

(i) The type of loading (barge or ship), loading start and end time, short-term throughputs.

(ii) Records of the vacuum provided by the vapor collection system and the time at which the system is connected and disconnected to and from the loading process.

(10) **Truck Loading**

(A) In addition to the recordkeeping requirements of subsection (g)(8), records shall indicate the short-term throughputs, method of transfer, and recent service or clean and vapor free status of the tank truck before loading.

(B) All lines and connectors for loading operations shall be visually inspected for any defects prior to hookup. Lines and connectors that are visibly damaged shall be removed from service. Operations shall cease immediately upon detection of any material leaking from the lines or connections.

(C) For controlled loading of tank trucks, one of the following requirements shall apply:

(i) A collection efficiency of 98.7 percent shall be claimed if a tank truck to be filled has certification of passing a vapor tightness test within the past 12 months conforming to the requirements of one of the following: 40 CFR Part 60 Subpart XX, 40 CFR Part 63, Subpart R, or United States Department of Transportation (U.S. DOT) pressure test requirements of 49 CFR § 180.407.

(ii) A collection efficiency of 99.2 percent shall be claimed if a tank truck to be filled has certification of passing a vapor tightness test within the past 12 months conforming to the requirements of one of 40 CFR Part 63, Subpart R or U.S. DOT pressure test requirements of 49 CFR § 180.407.

(iii) If the collection efficiency being claimed is 100 percent:

(I) Tank trucks shall be tested or inspected and certified within the past 12 months in accordance with U.S. DOT pressure test requirements of 49 CFR § 180.407 (Requirements for Test and Inspection of Specification Cargo Tanks), for pressure tank trucks rated at 15 pounds psig or greater; or

(II) For loading of material with vapor pressure greater than or equal to 0.5 psia at 95°F or the loading temperature, whichever is higher, a blower system shall be installed to produce a vacuum in the tank truck during all loading operations. A pressure/vacuum gauge shall be installed on the suction side of the loading rack blower system adjacent to the truck being loaded to verify a vacuum in that vessel. Loading shall not occur unless there is a vacuum of at least 1.5-inch water column being maintained by the vacuum-assist vapor collection system when loading trucks. The vacuum shall be recorded every 15 minutes during loading.

(D) For controlled tank truck loading, a tank truck shall not be filled unless it has passed a pressure test within the past 12 months as evidenced by a certificate or markings which shows the date the tank truck last passed the required pressure test and the identification number of the tank truck.

(11) **Rail Loading**

(A) For controlled rail loading of materials with vapor pressure of less than 0.5 psia at 95°F or the loading temperature, whichever is higher, a collection efficiency of 95 percent may be claimed with no additional testing requirements.

(B) In order to ensure 100 percent collection efficiency during railcar loading, the following requirements must be met:

(i) Each railcar to be loaded shall be pressure certified by the Class DOT-111AW or Class DOT-115AW testing or equivalent within the past 12 months prior to loading. A railcar shall not be loaded unless it has provided a certificate which shows the date the railcar last passed the required leak-tight test and the identification number of the railcar. Records of the date on which the testing was performed, and the test method used shall be maintained for each railcar loaded.

(ii) Hard-piped or bolted connections, and/or dry lock design hard-piped loading arms shall be used for all pressurized loading operations.

(iii) Each railcar to be loaded shall be designed to handle a pressure of 15 psig or greater.

(iv) Each railcar to be loaded shall not be equipped with a spew gauge.

(12) **Drum, Tote, and Non-ISO Container Loading**

(A) Loading of materials with vapor pressure greater than or equal to 0.5 psi at 95°F or the loading temperature, whichever is higher, into drums, totes, and/or non-ISO containers shall only be performed within a total enclosure or within a partial enclosure designed and operated with a capture velocity of at least 200 feet per minute (at the vent). The enclosure shall be designed and operated consistent with the specifications in “Industrial Ventilation: A Manual of Recommended Practice”. Collected vapors shall be routed to a control device. A copy of the enclosure design, minimum capture velocity calculations, and vacuum blower capacity shall be maintained and included in the registration.

(B) Drums, totes, and non-ISO containers shall remain closed at all times when material is not being added to them.

(13) **Gasoline Loading**

(A) Loading or dispensing of gasoline in affected counties as listed in 30 TAC § 114.309 (Affected Counties) must comply with the following:

(i) The loading or dispensing of gasoline is limited to gasolines meeting the applicable monthly Reid vapor pressure (RVP) standards specified in 40 CFR § 80.27(a)(2) (Controls and Prohibitions on Gasoline Volatility) and American Society for Testing and Materials (ASTM) D4814.

(ii) RVP data shall be obtained from the delivering refinery for each batch of gasoline delivered to the terminal by pipeline. Gasoline RVP data shall be reduced to monthly weighted averages of pipeline receipts for purposes of determining compliance with this standard permit.

(iii) Gasoline shall be analyzed for benzene two times per year. One test shall be during the summer (May 1 - September 15) and the other test shall be during the winter (November

1 - February 29). The record shall report benzene content for all grades of gasoline, and the content shall not exceed the amount represented in the registration. Gasoline analyses (laboratory certificates of analysis) from the delivering refinery are acceptable in place of on-site analysis.

(iv) Gasoline shall be analyzed for MTBE two times per year for gasoline that is going to be exported outside of the U.S. One test shall be during the summer (May 1 - September 15) and the other test shall be during the winter (November 1 - February 29). The record shall report MTBE content for all grades of gasoline, and the content shall not exceed the amount represented in the registration. Gasoline analyses (laboratory certificates of analysis) from the delivering refinery are acceptable in place of on-site analysis.

(B) During gasoline loading with Regenerative Carbon Adsorption Systems the following apply:

(i) Each monitor as required in paragraph (g)(20)(C) shall be quality assured at least semiannually using Cylinder Gas Audits (CGA) in accordance with 40 CFR Part 60, Appendix F, Procedure 1, Section 5.1.2, with the following exception: a relative accuracy test audit (RATA) is not required once every four quarters (i.e., two successive semiannual CGA may be conducted). An equivalent quality assurance method approved by the TCEQ may also be used. Successive semiannual audits shall occur no closer than four months. After completion of four consecutive satisfactory semiannual CGAs, the owner or operator may submit a request to perform this monitoring on a less frequent basis.

(ii) An alarm shall be installed such that an operation is alerted if the regenerative CAS outlet concentration exceeds a one-hour rolling average of 6,500 parts per million by volume (ppmv). The one-hour rolling average outlet concentration shall not exceed 9,500 ppmv.

(14) **Fugitives**

(A) The following Leak Detection and Repair (LDAR) programs are required as specified below. These are the only available LDAR programs for MLO registrations. If the registration representations claim control credit for a more stringent LDAR program than required below, that LDAR program must be implemented for components represented in the registration.

(i) 28LAER LDAR program is required for components represented in the registration as using the control credit for this program and for all fugitive components currently requiring 28LAER as authorized in previous permitting actions.

(ii) 28AVO LDAR program is required for components emitting chlorine, ammonia (NH_3), H_2S, hydrogen cyanide, mercaptans, and/or hydrogen fluoride. 28AVO shall only be claimed for the listed pollutants.

(iii) 28MID LDAR program (using 97 percent credit for valves, 93 percent for pumps, 95 percent for compressors, and 30 percent for flanges and connectors) is required for all fugitive components using ethylene oxide, phosgene, and/or butadiene emission factors or if control credit for this program is claimed in the registration.

(iv) 28PI LDAR program is required for all fugitive components using SOCMI non-leaker emission factors or if control credit for this program is claimed in the registration.

(v) The following minimum design, monitoring technique, or control requirements apply to all fugitive components in the registration. These requirements do not apply if the total uncontrolled potential to emit from the site is less than 10 tons per year (tpy) of VOC:

(I) 28M LDAR program (using 75 percent credit for valves, pumps, and compressors and 30 percent credit for flanges and connectors) is required if the total uncontrolled potential to emit at the site is greater than or equal to 10 tpy and less than 25 tpy VOC, unless following a more stringent LDAR program.

(II) 28VHP LDAR program (using 97 percent credit for valves, 85 percent credit for pumps and compressors, and 30 percent credit for flanges and connectors) is required if the total uncontrolled potential to emit from the site is greater than or equal to 25 tpy of VOC, unless following a more stringent LDAR program.

(III) 28RCT LDAR Program is required for all fugitive components subject to 30 TAC

Chapter 115.

(vi) No inspection is required for VOC emissions from mixtures in streams where the VOC has an aggregate partial pressure of less than 0.002 psi at 68 °F.

(B) Piping, Valves, Connectors, Pumps, Agitators and Compressors - Intensive Directed Maintenance (28LAER) - The following requirements apply to all fugitive components represented in the registration as using the control credit for this program and for all fugitive components currently requiring 28LAER as authorized in previous permitting actions:

(i) The requirements of subparagraphs (g)(14)(B)(vii) and (viii) shall not apply (1) where the VOC has an aggregate partial pressure or vapor pressure of less than 0.044 psia at 68 °F or (2) operating pressure is at least 5 kilopascals (0.725 psi) below ambient pressure. Equipment excluded from paragraph (g)(14)(B) shall be identified in a list or by one of the following methods and made readily available upon request. The exempted components may be identified by one or more of the following methods:

(I) piping and instrumentation diagram (PID);

(II) a written or electronic database or electronic file;

(III) color coding;

(IV) a form of weatherproof identification; or

(V) designation of exempted process unit boundaries.

(ii) Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable American National Standards Institute (ANSI), American Petroleum Institute (API), American Society of Mechanical Engineers (ASME), or equivalent codes.

(iii) New and reworked underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical. New and reworked buried connectors shall be welded.

(iv) To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak-checking during plant operation. Difficult-to-monitor and unsafe-to-monitor valves, as defined by 30 TAC Chapter 115, shall be identified in a list to be made readily available upon request. The difficult-to-monitor and unsafe-to-monitor valves may be identified by one or more of the methods described in subparagraph (g)(14)(B)(i). If an unsafe-to-monitor component is not considered safe to monitor within a calendar year, then it shall be monitored as soon as possible during safe to monitor times. A difficult-to-monitor component for which quarterly monitoring is specified may instead be monitored annually.

(v) New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter. Gas or hydraulic testing of the new and reworked piping connections at no less than operating pressure shall be performed prior to returning the components to service or they shall be monitored for leaks using an approved gas analyzer within 15 days of the components being returned to service. Adjustments shall be made as necessary to obtain leak-free performance. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through. In addition, all connectors shall be monitored by leak-checking for fugitive emissions at least quarterly using an approved gas analyzer with a directed maintenance program in accordance with subparagraph (g)(14)(B)(vii) - (xi). In lieu of the monitoring frequency specified in subparagraph (g)(14)(B)(iv), connectors may be monitored on a semiannual basis if the percent of connectors leaking for two consecutive quarterly monitoring periods is less than 0.5 percent. Connectors may be monitored on an annual basis if the percent of connectors leaking for two consecutive semiannual monitoring periods is less than 0.5 percent. If the percent of connectors leaking for any semiannual or annual monitoring period is 0.5 percent or greater, the facility shall revert to quarterly monitoring until the facility again qualifies for the alternative monitoring schedules previously outlined in this subparagraph, (g)(14)(B)(v). The percent of connectors leaking shall be determined using the following

formula: (Cl + Cs) x 100/Ct = Cp where:

Variable	Definition
Cl	The number of connectors found leaking by the end of the monitoring period, either by: • Method 21; or • sight, sound, and smell.
Cs	The number of connectors for which repair has been delayed and are listed on the facility shutdown log.
Ct	The total number of connectors in the facility subject to the monitoring requirements, as of the last day of the monitoring period, not including non-accessible and unsafe-to-monitor connectors.
Cp	The percentage of leaking connectors for the monitoring period.

(vi) Each open-ended valve or line shall be equipped with an appropriately sized cap, blind flange, plug, or a second valve to seal the line. Except during sampling, both valves shall be closed. If the isolation of equipment for hot work or the removal of a component for repair or replacement results in an open-ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 72 hours. If the repair or replacement is not completed within 72 hours, the owner or operator must complete either of the following actions within that time period:

(I) A cap, blind flange, plug, or second valve must be installed on the line or valve; or

(II) The open-ended valve or line shall be monitored once for leaks above background for a plant or unit turnaround lasting up to 45 days with an approved gas analyzer and the results recorded. For all other situations, the open-ended valve or line shall be monitored once by the end of the 72-hour period following the creation of the open-ended line and monthly thereafter with an approved gas analyzer and the results recorded. For turnarounds and all other situations, leaks are indicated by readings of 500 ppmv and must be repaired within 24 hours or a cap, blind flange, plug, or second valve must be installed on the line or valve.

(vii) Accessible valves shall be monitored by leak-checking for fugitive emissions at least quarterly using an approved gas analyzer with a directed maintenance program. Non accessible valves shall be monitored by leak-checking for fugitive emissions at least annually using an approved gas analyzer with a directed maintenance program. Sealless/leakless valves (including, but not limited to, welded bonnet bellows and diaphragm valves) and relief valves equipped with a rupture disc upstream or venting to a control device are not required to be monitored. For valves equipped with rupture discs, a pressure-sensing device shall be installed between the relief valve and rupture disc to monitor disc integrity. All leaking discs shall be replaced at the earliest opportunity but no later than the next process shutdown. A check of the reading of the pressure-sensing device to verify disc integrity shall be performed at least quarterly and recorded in the unit log or equivalent. Pressure-sensing devices that are continuously monitored with alarms are exempt from recordkeeping requirements specified in this subparagraph, (g)(14)(B)(vii). The gas analyzer shall conform to requirements listed in 40 CFR Part 60, Appendix A-7, Test Method 21. The gas analyzer shall be calibrated with methane. In addition, the response factor of the instrument for a specific VOC of interest shall be determined and meet the requirements of Section 8 of Method 21. If a mixture of VOCs is being monitored, the response factor shall be calculated for the average composition of the process fluid. A calculated average is not required when all of the compounds in the mixture have a response factor less than 10 using methane. If a response factor less than 10 cannot be achieved using methane, then the instrument may be calibrated with one of the VOC to be measured or any other VOC so long as the instrument has a response factor of less than 10 for each of the VOC to be measured. A directed maintenance program shall consist of the repair and maintenance of components assisted simultaneously by the use of an approved gas analyzer such that a minimum

concentration of leaking VOC is obtained for each component being maintained. Replaced components shall be re-monitored within 15 days of being placed back into VOC service.

(viii) All new and replacement pumps, compressors, and agitators shall be equipped with a shaft sealing system that prevents or detects emissions of VOC from the seal. These seal systems need not be monitored and may include (but are not limited to) dual pump seals with barrier fluid at higher pressure than process pressure, seals degassing to vent control systems kept in good working order, or seals equipped with an automatic seal failure detection and alarm system. Submerged pumps or sealless pumps (including, but not limited to, diaphragm, canned, or magnetic-driven pumps) may be used to satisfy the requirements of this section and need not be monitored. All other pump, compressor, and agitator seals shall be monitored with an approved gas analyzer at least quarterly.

(ix) Damaged or leaking valves, connectors, compressor seals, pump seals, and agitator seals found to be emitting VOC in excess of 500 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. A first attempt to repair the leak must be made within five days. Records of the first attempt to repair shall be maintained. A leaking component shall be repaired as soon as practicable, but no later than 15 days after the leak is found. If the repair of a component would require a unit shutdown that would create more emissions than the repair would eliminate, the repair may be delayed until the next scheduled shutdown. All leaking components that cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging. A listing of all components that qualify for delay of repair shall be maintained on a delay of repair list. The cumulative daily emissions from all components on the delay of repair list shall be estimated by multiplying by 24 the mass emission rate for each component calculated in accordance with the instructions in 30 TAC § 115.782(c)(1)(B)(i)(II). The calculations of the cumulative daily emissions from all components on the delay of repair list shall be updated within ten days of when the latest leaking component is added to the delay of repair list. When the cumulative daily emission rate of all components on the delay of repair list times the number of days until the next scheduled unit shutdown is equal to or exceeds the total emissions from a unit shutdown as calculated in accordance with 30 TAC § 115.782(c)(1)(B)(i)(I), the TCEQ Regional Office and any local programs shall be notified and may require early unit shutdown or other appropriate action based on the number and severity of tagged leaks awaiting shutdown. This notification shall be made within 15 days of making this determination.

(x) Records of repairs shall include date of repairs, repair results, justification for delay of repairs, and corrective actions taken for all components. Records of instrument monitoring shall indicate dates, times, test methods, and instrument readings. The instrument monitoring record shall include the time that monitoring took place for no less than 95 percent of the instrument readings recorded. Records of physical inspections shall be noted in the operator’s log or equivalent.

(xi) Compliance with the requirements of this section does not assure compliance with requirements of 30 TAC Chapter 115, an applicable NSPS, or an applicable NESHAP, and does not constitute approval of alternative standards for these regulations.

(xii) In lieu of the monitoring frequency specified in subparagraph (g)(14)(B)(vii), valves in gas and light liquid service may be monitored on a semiannual basis if the percent of valves leaking for two consecutive quarterly monitoring periods is less than 0.5 percent. Valves in gas and light liquid service may be monitored on an annual basis if the percent of valves leaking for two consecutive semiannual monitoring periods is less than 0.5 percent. If the percent of valves leaking for any semiannual or annual monitoring period is 0.5 percent or greater, the facility shall revert to quarterly monitoring until the facility again qualifies for the alternative monitoring schedules previously outlined in this subparagraph, (g)(14)(B)(xii).

(xiii) The percent of valves leaking used in subparagraph (g)(14)(B)(xii) shall be determined using the following formula: (Vl + Vs) x 100/Vt = Vp, where:

Variable	Definition
Vl	The number of valves found leaking by the end of the monitoring period, either by: • Method 21; or • sight, sound, and smell.
Vs	The number of valves for which repair has been delayed and are listed on the facility shutdown log.
Vt	The total number of valves in the facility subject to the monitoring requirements, as of the last day of the monitoring period, not including nonaccessible and unsafe-to-monitor valves.
Vp	The percentage of leaking valves for the monitoring period.

(xiv) Any component found to be leaking by physical inspection (i.e., sight, sound, or smell) shall be repaired or monitored with an approved gas analyzer within 15 days to determine whether the component is leaking in excess of 500 ppmv of VOC. If the component is found to be leaking in excess of 500 ppmv of VOC, it shall be subject to the repair and replacement requirements contained in this section.

(C) Piping, Valves, Connectors, Pumps, and Compressors (28AVO) – The following requirements apply to components represented in the registration as using the control credit for this program. 28AVO shall only be claimed for chlorine, NH_3, hydrogen sulfide, hydrogen cyanide, mercaptans, and/or hydrogen fluoride.

(i) Audio, olfactory, and visual checks for leaks within the operating area shall be made every four hours.

(ii) Immediately, but no later than one hour upon detection of a leak, plant personnel shall take at least one of the following actions:

(I) Isolate the leak.

(II) Commence repair or replacement of the leaking component.

(III) Use a leak collection/containment system to prevent the leak until repair or replacement can be made if immediate repair is not possible.

(iii) Date and time of each inspection shall be noted in the operator's log or equivalent. Records shall be of all repairs and replacements made due to leaks.

(D) Piping, Valves, Connectors, Pumps, Agitators and Compressors - Intensive Directed Maintenance (28MID) - The following requirements apply to all fugitive components using ethylene oxide, phosgene, and/or butadiene emission factors or if control credit for this program is claimed in the registration.

(i) The requirements of subparagraph (g)(14)(D)(vi) and (vii) shall not apply (1) where the VOC has an aggregate partial pressure or vapor pressure of less than 0.044 psia at 68°F or (2) where the operating pressure is at least 5 kilopascals (0.725 psi) below ambient pressure. Equipment excluded from paragraph (g)(14)(D) shall be identified in a list or by one of the following methods and made available upon request. The exempted components may be identified by one or more of the following methods:

(I) PID;

(II) a written or electronic database or electronic file;

(III) color coding;

(IV) a form of weatherproof identification; or

(V) designation of exempted process unit boundaries.

(ii) Construction of new and reworked piping, valves, pump systems, agitators, and compressor systems shall conform to applicable ANSI, API, ASME, or equivalent codes.

(iii) New and reworked underground process pipelines shall contain no buried valves such

that fugitive emission monitoring is rendered impractical. New and reworked buried connectors shall be welded.

(iv) To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak-checking during plant operation. Difficult-to-monitor and unsafe-to-monitor valves, as defined by 30 TAC Chapter 115, shall be identified in a list to be made available upon request. The difficult-to-monitor and unsafe-to-monitor valves may be identified by one or more of the methods described in subparagraph (g)(14)(D)(i). If an unsafe-to-monitor component is not considered safe to monitor within a calendar year, then it shall be monitored as soon as possible during safe to monitor times. A difficult-to-monitor component for which quarterly monitoring is specified may instead be monitored annually.

(v) New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter. Gas or hydraulic testing of the new and reworked piping connections at no less than operating pressure shall be performed prior to returning the components to service or they shall be monitored for leaks using an approved gas analyzer within 15 days of the components being returned to service. Adjustments shall be made as necessary to obtain leak-free performance. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through. Each open-ended valve or line shall be equipped with an appropriately sized cap, blind flange, plug, or a second valve to seal the line. Except during sampling, both valves shall be closed. If the isolation of equipment for hot work or the removal of a component for repair or replacement results in an open-ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 72 hours. If the repair or replacement is not completed within 72 hours, the owner or operator must complete either of the following actions within that time period:

(I) a cap, blind flange, plug, or second valve must be installed on the line or valve; or

(II) the open-ended valve or line shall be monitored once for leaks above background for a plant or unit turnaround lasting up to 45 days with an approved gas analyzer and the results recorded. For all other situations, the open-ended valve or line shall be monitored once by the end of the 72-hour period following the creation of the open-ended line and monthly thereafter with an approved gas analyzer and the results recorded. For turnarounds and all other situations, leaks are indicated by readings of 500 ppmv and must be repaired within 24 hours or a cap, blind flange, plug, or second valve must be installed on the line or valve.

(vi) Accessible valves shall be monitored by leak-checking for fugitive emissions at least quarterly using an approved gas analyzer with a directed maintenance program. Sealless/leakless valves (including, but not limited to, welded bonnet bellows and diaphragm valves) and relief valves equipped with a rupture disc upstream or venting to a control device are not required to be monitored. For valves equipped with rupture discs, a pressure-sensing device shall be installed between the relief valve and rupture disc to monitor disc integrity. All leaking discs shall be replaced at the earliest opportunity but no later than the next process shutdown. A check of the reading of the pressure-sensing device to verify disc integrity shall be performed at least quarterly and recorded in the unit log or equivalent. Pressure-sensing devices that are continuously monitored with alarms are exempt from recordkeeping requirements specified in this subparagraph, (g)(14)(D)(vi). An approved gas analyzer shall conform to requirements listed in 40 CFR Part 60, Appendix A-7, Test Method 21. The gas analyzer shall be calibrated with methane. In addition, the response factor of the instrument for a specific VOC of interest shall be determined and meet the requirements of Section 8 of Method 21. If a mixture of VOCs is being monitored, the response factor shall be calculated for the average composition of the process fluid. A calculated average is not required when all of the compounds in the mixture have a response factor less than 10 using methane. If a response factor less than 10 cannot be achieved using methane, then the instrument may be calibrated with one of the VOCs to be measured or any other VOC so long as the instrument has a response factor of less than 10 for each of the VOC to be measured. A directed maintenance program shall consist of the repair and maintenance of

components assisted simultaneously by the use of an approved gas analyzer such that a minimum concentration of leaking VOC is obtained for each component being maintained. A first attempt to repair the leak must be made within five days. Records of the first attempt to repair shall be maintained. Replaced components shall be re-monitored within 15 days of being placed back into VOC service.

(vii) All new and replacement pumps, compressors, and agitators shall be equipped with a shaft sealing system that prevents or detects emissions of VOC from the seal. These seal systems need not be monitored and may include (but are not limited to) dual pump seals with barrier fluid at higher pressure than process pressure, seals degassing to vent control systems kept in good working order, or seals equipped with an automatic seal failure detection and alarm system. Submerged pumps or sealless pumps (including, but not limited to, diaphragm, canned, or magnetic-driven pumps) may be used to satisfy the requirements of this section and need not be monitored. All other pump, compressor, and agitator seals shall be monitored with an approved gas analyzer at least quarterly.

(viii) Damaged or leaking valves, connectors, compressor seals, pump seals, and agitator seals found to be emitting VOC in excess of 500 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. A leaking component shall be repaired as soon as practicable, but no later than 15 days after the leak is found. If the repair of a component would require a unit shutdown that would create more emissions than the repair would eliminate, the repair may be delayed until the next scheduled shutdown. All leaking components that cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging. A listing of all components that qualify for delay of repair shall be maintained on a delay of repair list. The cumulative daily emissions from all components on the delay of repair list shall be estimated by multiplying by 24 the mass emission rate for each component calculated in accordance with the instructions in 30 TAC § 115.782(c)(1)(B)(i)(II). The calculations of the cumulative daily emissions from all components on the delay of repair list shall be updated within ten days of when the latest leaking component is added to the delay of repair list. When the cumulative daily emission rate of all components on the delay of repair list times the number of days until the next scheduled unit shutdown is equal to or exceeds the total emissions from a unit shutdown as calculated in accordance with 30 TAC § 115.782(c)(1)(B)(i)(I), the TCEQ Regional Office and any local programs shall be notified and may require early unit shutdown or other appropriate action based on the number and severity of tagged leaks awaiting shutdown. This notification shall be made within 15 days of making this determination.

(ix) In lieu of the monitoring frequency specified in subparagraph (g)(14)(D)(vi), valves in gas and light liquid service may be monitored on a semiannual basis if the percent of valves leaking for two consecutive quarterly monitoring periods is less than 0.5 percent. Valves in gas and light liquid service may be monitored on an annual basis if the percent of valves leaking for two consecutive semiannual monitoring periods is less than 0.5 percent. If the percent of valves leaking for any semiannual or annual monitoring period is 0.5 percent or greater, the facility shall revert to quarterly monitoring until the facility again qualifies for the alternative monitoring schedules previously outlined in this subparagraph, (g)(14)(D)(ix).

(x) The percent of valves leaking used in subparagraph (g)(14)(D)(ix) shall be determined using the following formula: (Vl + Vs) x 100/Vt = Vp where:

Variable	Definition
Vl	The number of valves found leaking by the end of the monitoring period, either by: • Method 21; or • sight, sound, and smell.
Vs	The number of valves for which repair has been delayed and are listed on the facility shutdown log.
Vt	The total number of valves in the facility subject to the monitoring requirements, as of the last day of the monitoring period, not including nonaccessible and unsafe-to-monitor valves.
Vp	The percentage of leaking valves for the monitoring period.

(xi) Records of repairs shall include date of repairs, repair results, justification for delay of repairs, and corrective actions taken for all components. Records of instrument monitoring shall indicate dates and times, test methods, and instrument readings. The instrument monitoring record shall include the time that monitoring took place for no less than 95 percent of the instrument readings recorded. Records of physical inspections shall be noted in the operator's log or equivalent.

(xii) Compliance with the requirements of this section does not assure compliance with requirements of 30 TAC Chapter 115, an applicable NSPS, or an applicable NESHAP and does not constitute approval of alternative standards for these regulations.

(E) Piping, Valves, Pumps, and Compressors 28PI – The following requirements apply to all fugitive components using SOCMI non-leaker emission factors or if control credit for this program is claimed in the registration:

(i) Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable ANSI, API, ASME, or equivalent codes.

(ii) New and reworked underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical.

(iii) To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak-checking during plant operation. Non-accessible valves, as defined in 30 TAC Chapter 115, shall be identified in a list to be made available upon request.

(iv) New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter.

(v) Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve. Except during sampling, the second valve shall be closed.

(vi) All piping components shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through.

(vii) Damaged or leaking valves, connectors, compressor seals, and pump seals found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. A leaking component shall be repaired as soon as practicable, but no later than 15 days after the leak is found. If the repair of a component would require a unit shutdown, the repair may be delayed until the next scheduled shutdown. All leaking components which cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging. At the discretion of the TCEQ Executive Director or designated representative, early unit shutdown or other appropriate action may be required based on the number and severity of tagged leaks awaiting shutdown.

(viii) Date and time of each inspection shall be noted in the operator's log or equivalent. Records shall be of all repairs and replacements made due to leaks.

(F) Piping, Valves, Connectors, Pumps, Agitators, and Compressors 28M - The following requirements apply to piping, valves, connectors, pumps, agitators, and compressors which are

required to meet 28M LDAR program as listed above or represented in the registration as complying with the 28M LDAR program:

(i) The requirements of subparagraphs (g)(14)(F)(vi) and (vii) shall not apply (1) where the VOC has an aggregate partial pressure or vapor pressure of less than 0.5 pounds psia at 100 °F or at maximum process operating temperature if less than 100 °F or (2) where the operating pressure is at least 5 kilopascals (0.725 psi) below ambient pressure. Equipment excluded from this requirement shall be identified in a list or by one of the methods described below to be made readily available upon request.

The exempted components may be identified by one or more of the following methods:

(I) piping and instrumentation diagram (PID);

(II) a written or electronic database or electronic file;

(III) color coding;

(IV) a form of weatherproof identification; or

(V) designation of exempted process unit boundaries.

(ii) Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to ANSI, API, ASME, or equivalent codes.

(iii) New and reworked underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical. New and reworked buried connectors shall be welded.

(iv) To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak-checking during plant operation. Difficult-to-monitor and unsafe-to-monitor valves, as defined by 30 TAC Chapter 115, shall be identified in a list to be made readily available upon request. The difficult-to-monitor and unsafe-to-monitor valves may be identified by one or more of the methods described in (g)(14)(F)(i). If an unsafe-to-monitor component is not considered safe to monitor within a calendar year, then it shall be monitored as soon as possible during safe-to-monitor times. A difficult-to-monitor component for which quarterly monitoring is specified may instead be monitored annually.

(v) New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter. Gas or hydraulic testing of the new and reworked piping connections at no less than operating pressure shall be performed prior to returning the components to service or they shall be monitored for leaks using an approved gas analyzer within 15 days of the components being returned to service. Adjustments shall be made as necessary to obtain leak-free performance. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through.

Each open-ended valve or line shall be equipped with an appropriately sized cap, blind flange, plug, or a second valve to seal the line. Except during sampling, both valves shall be closed. If the isolation of equipment for hot work or the removal of a component for repair or replacement results in an open-ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 72 hours. If the repair or replacement is not completed within 72 hours, the owner or operator must complete either of the following actions within that time period:

(I) a cap, blind flange, plug, or second valve must be installed on the line or valve; or

(II) the open-ended valve or line shall be monitored once for leaks above background for a plant or unit turnaround lasting up to 45 days with an approved gas analyzer and the results recorded. For all other situations, the open-ended valve or line shall be monitored once by the end of the 72-hour period following the creation of the open-ended line and monthly thereafter with an approved gas analyzer and the results recorded. For turnarounds and all other situations, leaks are indicated by readings of 500 ppmv and must be repaired within 24 hours or a cap, blind flange, plug, or second valve must be installed on the line or valve.

(vi) Accessible valves shall be monitored by leak-checking for fugitive emissions at least quarterly using an approved gas analyzer. Sealless/leakless valves (including, but not limited to, welded bonnet bellows and diaphragm valves) and relief valves equipped with a rupture disc upstream or venting to a control device are not required to be monitored. For valves equipped with rupture discs, a pressure-sensing device shall be installed between the relief valve and rupture disc to monitor disc integrity. All leaking discs shall be replaced at the earliest opportunity but no later than the next process shutdown.

A check of the reading of the pressure-sensing device to verify disc integrity shall be performed at least quarterly and recorded in the unit log or equivalent. Pressure-sensing devices that are continuously monitored with alarms are exempt from recordkeeping requirements specified in this paragraph.

The gas analyzer shall conform to requirements listed in Method 21 of 40 CFR Part 60, Appendix A. The gas analyzer shall be calibrated with methane. In addition, the response factor of the instrument for a specific VOC of interest shall be determined and meet the requirements of Section 8 of Method 21. If a mixture of VOCs is being monitored, the response factor shall be calculated for the average composition of the process fluid. A calculated average is not required when all of the compounds in the mixture have a response factor less than 10 using methane. If a response factor less than 10 cannot be achieved using methane, then the instrument may be calibrated with one of the VOC to be measured or any other VOC so long as the instrument has a response factor of less than 10 for each of the VOC to be measured.

(vii) Except as may be provided for in this standard permit, all pump, compressor and agitator seals shall be monitored with an approved gas analyzer at least quarterly or be equipped with a shaft sealing system that prevents or detects emissions of VOC from the seal. Seal systems designed and operated to prevent emissions or seals equipped with automatic seal failure detection and alarm system need not be monitored. Seal systems that prevent emissions may include (but are not limited to) dual pump seals with barrier fluid at higher pressure than process pressure or seals degassing to vent control systems kept in good working order.

Submerged pumps or sealless pumps (including, but not limited to, diaphragm, canned, or magnetic-driven pumps) may be used to satisfy the requirements of this paragraph and need not be monitored.

(viii) Damaged or leaking valves, connectors, compressor seals, agitator seals, and pump seals found to be emitting VOC in excess of 10,000 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. A first attempt to repair the leak must be made within five days. Records of the first attempt to repair shall be maintained. A leaking component shall be repaired as soon as practicable, but no later than 15 days after the leak is found. If the repair of a component would require a unit shutdown, the repair may be delayed until the next scheduled shutdown. All leaking components which cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging. At the discretion of the TCEQ Executive Director or designated representative, early unit shutdown or other appropriate action may be required based on the number and severity of tagged leaks awaiting shutdown.

(ix) Records of repairs shall include date of repairs, repair results, justification for delay of repairs, and corrective actions taken for all components. Records of instrument monitoring shall indicate dates and times, test methods, and instrument readings. The instrument monitoring record shall include the time that monitoring took place for no less than 95 percent of the instrument readings recorded. Records of physical inspections shall be noted in the operator's log or equivalent.

(x) Fugitive emission monitoring required by an applicable NSPS, 40 CFR Part 60, or an applicable NESHAP, 40 CFR Part 61, may be used in lieu of subparagraphs (g)(14)(F)(vi) through (ix) of this condition.

(xi) Compliance with the requirements of paragraph (g)(14)(F) does not assure compliance with requirements of NSPS or NESHAPS and does not constitute approval of alternate standards for these regulations.

(G) Piping, Valves, Connectors, Pumps, Agitators, and Compressors 28VHP - The following

requirements apply to piping, valves, connectors, pumps, agitators, and compressors containing or in contact with fluids that could reasonably be expected to contain greater than or equal to 10 weight percent VOC at any time or if represented in the registration as complying with the 28VHP LDAR program.

(i) The requirements of subparagraphs (g)(14)(G)(vi) and (vii) shall not apply where (1) the VOC has an aggregate partial pressure or vapor pressure of less than 0.044 psia at 68 °F or (2) operating pressure is at least 5 kilopascals (0.725 pounds per square inch (psi)) below ambient pressure. Equipment excluded from this section shall be identified in a list or by one of the following methods and made readily available upon request. The exempted components may be identified by one or more of the following methods:

(I) piping and instrumentation diagram (PID);

(II) a written or electronic database or electronic file;

(III) color coding;

(IV) a form of weatherproof identification; or

(V) designation of exempted process unit boundaries.

(ii) Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to ANSI, API, ASME, or equivalent codes.

(iii) New and reworked underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical. New and reworked buried connectors shall be welded.

(iv) To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be located to be reasonably accessible for leak-checking during plant operation. Difficult-to-monitor and unsafe-to-monitor valves, as defined by 30 TAC Chapter 115 (Control of Air Pollution From Volatile Organic Compounds), shall be identified in a list to be made readily available upon request. The difficult-to-monitor and unsafe-to-monitor valves may be identified by one or more of the methods described in subparagraph (g)(14)(G)(i). If an unsafe-to-monitor component is not considered safe to monitor within a calendar year, then it shall be monitored as soon as possible during safe to monitor times. A difficult-to-monitor component for which quarterly monitoring is specified may instead be monitored annually.

(v) New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter. Gas or hydraulic testing of the new and reworked piping connections at no less than the operating pressure shall be performed prior to returning the components to service or they shall be monitored for leaks using an approved gas analyzer within 15 days of the components being returned to service. Adjustments shall be made as necessary to obtain leak-free performance. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through. Each open-ended valve or line shall be equipped with an appropriately sized cap, blind flange, plug, or a second valve to seal the line. Except during sampling, both valves shall be closed. If the isolation of equipment for hot work or the removal of a component for repair or replacement results in an open-ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 72 hours. If the repair or replacement is not completed within 72 hours, the owner or operator must complete either of the following actions within that time period:

(I) a cap, blind flange, plug, or second valve must be installed on the line or valve; or

(II) the open-ended valve or line shall be monitored once for leaks above background for a plant or unit turnaround lasting up to 45 days with an approved gas analyzer and the results recorded. For all other situations, the open-ended valve or line shall be monitored once within the 72-hour period following the creation of the open-ended line and monthly thereafter with an approved gas analyzer and the results recorded. For turnarounds and all other situations, leaks are indicated by readings of 500 ppmv and must be repaired within 24 hours or a

cap, blind flange, plug, or second valve must be installed on the line or valve.

(vi) Accessible valves shall be monitored by leak-checking for fugitive emissions at least quarterly using an approved gas analyzer. Sealless/leakless valves (including, but not limited to, welded bonnet bellows and diaphragm valves) and relief valves equipped with a rupture disc upstream or venting to a control device are not required to be monitored. If a relief valve is equipped with rupture disc, a pressure-sensing device shall be installed between the relief valve and rupture disc to monitor disc integrity. A check of the reading of the pressure-sensing device to verify disc integrity shall be performed at least quarterly and recorded in the unit log or equivalent. Pressure-sensing devices that are continuously monitored with alarms are exempt from recordkeeping requirements specified in subparagraph (g)(14)(G)(vi). All leaking discs shall be replaced at the earliest opportunity but no later than the next process shutdown. The gas analyzer shall conform to requirements listed in 40 CFR Part 60, Appendix A-7, Test Method 21. The gas analyzer shall be calibrated with methane. In addition, the response factor of the instrument for a specific VOC of interest shall be determined and meet the requirements of Section 8 of Method 21. If a mixture of VOCs is being monitored, the response factor shall be calculated for the average composition of the process fluid. A calculated average is not required when all of the compounds in the mixture have a response factor less than 10 using methane. If a response factor less than 10 cannot be achieved using methane, then the instrument may be calibrated with one of the VOCs to be measured or any other VOC so long as the instrument has a response factor of less than 10 for each of the VOC to be measured. Replacements for leaking components shall be re-monitored within 15 days of being placed back into VOC service.

(vii) Except as provided for in this standard permit, all pump, compressor, and agitator seals shall be monitored with an approved gas analyzer at least quarterly or be equipped with a shaft sealing system that prevents or detects emissions of VOC from the seal. Seal systems designed and operated to prevent emissions or seals equipped with automatic seal failure detection and alarm system need not be monitored. These seal systems may include (but are not limited to) dual pump seals with barrier fluid at higher pressure than process pressure, seals degassing to vent control systems kept in good working order, or seals equipped with an automatic seal failure detection and alarm system. Submerged pumps or sealless pumps (including, but not limited to, diaphragm, canned, or magnetic-driven pumps) may be used to satisfy the requirements of this section and need not be monitored.

(viii) Damaged or leaking valves or connectors found to be emitting VOC in excess of 500 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. Damaged or leaking pump, compressor, and agitator seals found to be emitting VOC in excess of 2,000 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. A first attempt to repair the leak must be made within five days and a record of the attempt shall be maintained.

(ix) A leaking component shall be repaired as soon as practicable, but no later than 15 days after the leak is found. If the repair of a component would require a unit shutdown that would create more emissions than the repair would eliminate, the repair may be delayed until the next scheduled shutdown. All leaking components that cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging within 15 days of the detection of the leak. A listing of all components that qualify for delay of repair shall be maintained on a delay of repair list. The cumulative daily emissions from all components on the delay of repair list shall be estimated by multiplying by 24 the mass emission rate for each component calculated in accordance with the instructions in 30 TAC § 115.782(c)(1)(B)(i)(II) (Procedures and Schedule for Leak Repair and Follow-up). The calculations of the cumulative daily emissions from all components on the delay of repair list shall be updated within ten days of when the latest leaking component is added to the delay of repair list. When the cumulative daily emission rate of all components on the delay of repair list times the number of days until the next scheduled unit shutdown is equal to or exceeds the total emissions from a unit shutdown as calculated in accordance with 30 TAC § 115.782(c)(1)(B)(i)(I) or 500 pounds, whichever is greater, the TCEQ Regional Office and any local programs shall be notified and the TCEQ Executive

Director may require early unit shutdown or other appropriate action based on the number and severity of tagged leaks awaiting shutdown. This notification shall be made within 15 days of making this determination.

(x) Records of repairs shall include date of repairs, repair results, justification for delay of repairs, and corrective actions taken for all components. Records of instrument monitoring shall indicate dates and times, test methods, and instrument readings. The instrument monitoring record shall include the time that monitoring took place for no less than 95 percent of the instrument readings recorded. Records of physical inspections shall be noted in the operator's log or equivalent.

(xi) Alternative monitoring frequency schedules of 30 TAC §§ 115.352 - 115.359 (Control Requirements - Counties and Compliance Schedules) or 40 CFR Part 63, Subpart H (National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks), may be used in lieu of subparagraphs (g)(14)(G)(vi) and (vii).

(xii) Compliance with the requirements of paragraph (g)(14)(G) does not assure compliance with requirements of 30 TAC Chapter 115, an applicable NSPS, or an applicable NESHAP and does not constitute approval of alternative standards for these regulations.

(H) Piping, Valves, Pumps, and Compressors 28RCT – The following requirements apply to all fugitive components subject to 30 TAC Chapter 115:

(i) The requirements of subparagraphs (g)(14)(H)(vi) and (vii) shall not apply (1) where the VOC has an aggregate partial pressure or vapor pressure equal to or less than 0.044 psia at 68 °F or (2) operating pressure is at least 5 kilopascals (0.725 psi) below ambient pressure. Equipment excluded from this requirement shall be identified in a list or by one of the methods described below to be made available upon request. The exempted components may be identified by one or more of the following methods:

(I) PID;

(II) a written or electronic database or electronic file;

(III) color coding;

(IV) a form of weatherproof identification; or

(V) designation of exempted process unit boundaries.

(ii) Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable ANSI, API, ASME, or equivalent codes.

(iii) New and reworked underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical. New and reworked buried connectors shall be welded.

(iv) To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak checking during plant operation. Non-accessible valves, as defined by 30 TAC Chapter 115, shall be identified in a list to be made available upon request. The non-accessible valves may be identified by one or more of the methods described in subparagraph (g)(14)(H)(i) above.

(v) New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter. Gas or hydraulic testing of the new and reworked piping connections at no less than operating pressure shall be performed prior to returning the components to service or they shall be monitored for leaks using an approved gas analyzer within 15 days of the components being returned to service. Adjustments shall be made as necessary to obtain leak-free performance. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through.

Each open-ended valve or line shall be equipped with an appropriately sized cap, blind flange, plug, or a second valve to seal the line. Except during sampling, both valves shall be closed. If the isolation of equipment for hot work or the removal of a component for repair or replacement results in an open-ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 72 hours. If the repair

or replacement is not completed within 72 hours, the owner or operator must complete either of the following actions within that time period:

(I) a cap, blind flange, plug, or second valve must be installed on the line or valve; or

(II) the open-ended valve or line shall be monitored once for leaks above background for a plant or unit turnaround lasting up to 45 days with an approved gas analyzer and the results recorded. For all other situations, the open-ended valve or line shall be monitored once by the end of the 72 hours period following the creation of the open-ended line and monthly thereafter with an approved gas analyzer and the results recorded. For turnarounds and all other situations, leaks are indicated by readings of 500 ppmv and must be repaired within 24 hours or a cap, blind flange, plug, or second valve must be installed on the line or valve.

(vi) Accessible valves shall be monitored by leak-checking for fugitive emissions at least quarterly using an approved gas analyzer. Sealless/leakless valves (including, but not limited to, welded bonnet bellows and diaphragm valves) and relief valves equipped with a rupture disc upstream or venting to a control device are not required to be monitored. For valves equipped with rupture discs, a pressure-sensing device shall be installed between the relief valve and rupture disc to monitor disc integrity. All leaking discs shall be replaced at the earliest opportunity but no later than the next process shutdown. A check of the reading of the pressure-sensing device to verify disc integrity shall be performed at least quarterly and recorded in the unit log or equivalent. Pressure-sensing devices that are continuously monitored with alarms are exempt from recordkeeping requirements specified in this paragraph.

An approved gas analyzer shall conform to requirements listed in Method 21 of 40 CFR Part 60, Appendix A. The gas analyzer shall be calibrated with methane. In addition, the response factor of the specific VOC of interest shall be determined and meet the requirements of Section 8 of Method 21. If a mixture of VOCs is being monitored, the response factor shall be calculated for the average composition of the process fluid. A calculated average is not required when all of the compounds in the mixture have a response factor less than 10 using methane. If a response factor less than 10 cannot be achieved using methane, then the instrument may be calibrated with one of the VOC to be measured or any other VOC so long as the instrument has a response factor of less than 10 for each of the VOC to be measured. Replacements for leaking components shall be re-monitored within 15 days of being placed back into VOC service.

(vii) Unless noted otherwise in this standard permit, all pump, compressor and agitator seals shall be monitored with an approved gas analyzer at least quarterly or be equipped with a shaft sealing system that prevents or detects emissions of VOC from the seal. Seal systems designed and operated to prevent emissions or seals equipped with automatic seal failure detection and alarm system need not be monitored. These seal systems may include (but are not limited to) dual pump seals with barrier fluid at higher pressure than process pressure, seals degassing to vent control systems kept in good working order, or seals equipped with an automatic seal failure detection and alarm system. Submerged pumps or sealless pumps (including, but not limited to, diaphragm, canned, or magnetic-driven pumps) may be used to satisfy the requirements of this paragraph and need not be monitored.

(viii) Damaged or leaking valves or connectors found to be emitting VOC in excess of 500 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. Damaged or leaking pump, compressor, and agitator seals found to be emitting VOC in excess of 10,000 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. A first attempt to repair the leak must be made within five days. Records of the first attempt to repair shall be maintained.

(ix) A leaking component shall be repaired as soon as practicable, but no later than 15 days after the leak is found. If the repair of a component would require a unit shutdown, that would create more emissions than the repair would eliminate, the repair may be delayed until the next scheduled shutdown. All leaking components which cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging. A listing of all

components that qualify for delay of repair shall be maintained on a delay of repair list. The cumulative daily emissions from all components on the delay of repair list shall be estimated by multiplying by 24 the mass emission rate for each component calculated in accordance with the instructions in 30 TAC § 115.782 (c)(1)(B)(i)(II). The calculations of the cumulative daily emissions from all components on the delay of repair list shall be updated within ten days of when the latest leaking component is added to the delay of repair list. When the cumulative daily emission rate of all components on the delay of repair list times the number of days until the next scheduled unit shutdown is equal to or exceeds the total emissions from a unit shutdown, the TCEQ Regional Office and any local programs shall be notified and may require early unit shutdown or other appropriate action based on the number and severity of tagged leaks awaiting shutdown. This notification shall be made within 15 days of making this determination.

(x) Records of repairs shall include date of repairs, repair results, justification for delay of repairs, and corrective actions taken for all components. Records of instrument monitoring shall indicate dates and times, test methods, and instrument readings. The instrument monitoring record shall include the time that monitoring took place for no less than 95 percent of the instrument readings recorded. Records of physical inspections shall be noted in the operator's log or equivalent.

(xi) Fugitive emission monitoring required by 30 TAC Chapter 115 may be used in lieu of subparagraphs (g)(14)(H)(vi) and (vii) of this condition.

(xii) Compliance with the requirements of this condition does not assure compliance with requirements of an applicable NSPS or an applicable NESHAP and does not constitute approval of alternative standards for these regulations.

(15) **Storage Tanks and ISO Containers**

(A) All storage tank operations are limited to the materials, rates, and throughputs identified in the registration. Storage tanks, except for pressurized tanks, shall be equipped with permanent submerged fill pipes. Rolling 12-month facility throughput records shall be updated on a monthly basis for each material stored.

(B) Floating roof storage tanks shall not store any liquid with true vapor pressure greater than or equal to 11.0 psia.

(C) For constant level tanks in which liquid is pumped in and out at the same time, tank liquid height shall be monitored continuously. A record of the tanks' liquid height shall be maintained on a rolling 12-month basis.

(D) For heated tanks, the temperature of the liquid shall be maintained less than or equal to the temperature corresponding to the vapor pressure represented in the registration and emissions estimates. The tank temperature shall be continuously monitored, and the temperature shall be recorded daily and during tank filling. The temperature monitor shall be calibrated on an annual basis to meet an accuracy specification of ±0.75 percent of the temperature being measured and expressed in degrees Celsius or ±2.5°C. Up to five percent invalid monitoring data is acceptable on a rolling 12-month basis provided it is only generated when the monitor is broken down, out-of-control (producing inaccurate data); being repaired, having maintenance performed, or being calibrated. The data availability shall be calculated as the total tank operating hours for which quality assured data was recorded divided by the total tank hours in service. Invalid data generated due to other reasons is not allowed. The measurements missed shall be estimated using good engineering judgement and the methods used recorded.

(E) Storage tanks are subject to the following requirements: The control requirements specified in clauses (i) - (v) of this subparagraph shall not apply (1) where the VOC has an aggregate partial pressure of less than 0.50 psia at the maximum feed temperature or 95°F, whichever is greater; or (2) storage tanks smaller than 25,000 gallons.

(i) The tank emissions must be controlled by one of the following:

(I) An internal floating deck or roof shall be installed. A domed external floating roof tank is equivalent to an internal floating roof tank. The floating roof shall be equipped with one of the following closure devices between the wall of the storage vessel and the edge of the floating roof:

(-a-) a liquid-mounted seal;

(-b-) two continuous seals mounted one above the other; or

(-c-) a mechanical shoe seal.

(II) An open-top tank shall contain a floating roof (external floating roof tank) which uses double seal or secondary seal technology provided the primary seal consists of either a mechanical shoe seal or a liquid-mounted seal and the secondary seal is rim-mounted. A weathershield is not approvable as a secondary seal.

(III) All vents from the tank shall be routed to a control device listed in subsection (c)(1) (Authorized Facilities and Activities).

(ii) For any tank equipped with a floating roof, the visual inspections and seal gap measurements specified in either Title 40 CFR § 60.113b (Testing and Procedures (as amended at 54 Federal Register (FR) 32973, Aug. 11, 1989)) or according to an alternative specified in 40 CFR § 60.110b(e) (as amended at 86 FR 5019, Jan. 19, 2021) shall be performed to verify fitting and seal integrity. Records shall be maintained of the dates inspection was performed, any measurements made, results of inspections and measurements made (including raw data), and actions taken to correct any deficiencies noted.

(iii) The floating roof design shall incorporate sufficient flotation to conform to the requirements of API Code 650 dated November 1, 1998, except that an internal floating cover need not be designed to meet rainfall support requirements and the materials of construction may be steel or other materials.

(iv) Each tank shall be designed and constructed with a sloped bottom and a sump that can be emptied in such a way that all standing liquid is drained to the lowest level possible. If present, the volume of standing liquid shall not exceed the volume of standing liquid represented in the registration.

(v) Tanks constructed under this standard permit shall be equipped with a connection to a vapor recovery system that routes vapors from the vapor space under the landed roof to a control device.

(vi) Except for labels, logos, etc. not to exceed 15 percent of the tank total surface area, uninsulated tank exterior surfaces exposed to the sun shall be white or unpainted aluminum. Heated tanks are not subject to this requirement.

(F) The concentration of H_2S in the storage tanks shall not exceed the concentration represented in the registration. If materials containing H_2S are handled in storage tanks, then the following requirements apply:

(i) If the dissolved H_2S concentration in the materials is represented in the registration, the dissolved H_2S concentration of each material stock to be stored in the storage tanks identified in subsection (g)(15) shall be determined in order to demonstrate compliance. The H_2S concentration shall be determined using method ASTM UOP163, ASTM D5705, or ASTM D7621.

(ii) If the H_2S concentration in the vapor space of the storage tank is represented in the registration, sampling to determine the concentration of H_2S in tank vapor spaces shall be conducted in order to demonstrate compliance. H_2S concentration may be determined using an instrument meeting the requirements of (i) above, except that the “release concentration” shall be the vapor concentration represented in the registration.

(iii) The frequency of sampling shall be completed annually or within 60 days of any change of service for an affected tank, whichever occurs more frequently.

(iv) Records of H_2S concentrations measured to meet the requirements in paragraph (g)(15)(F) shall be maintained.

(G) This standard permit authorizes emissions from control devices for the storage tanks represented in the registration and emissions estimates during planned floating roof landings not associated with MSS. Tank roof landings include all operations when the tank floating roof is on its lowest supporting legs, or a low position intended for maintenance in the case of a cable-suspended

roof. These emissions are subject to the emission rates represented in the registration. The following requirements apply to tank roof landings:

(i) At all times that the roof is resting on its leg supports or cables, the tank emissions shall be controlled by a closed vent system and control device meeting the following specifications:

(I) The closed vent system shall be designed to collect all VOC vapors and gases discharged from the storage vessel and operated with no detectable emissions as indicated by an instrument reading of less than 500 ppmv above background and visual inspections, as determined in Part 60, Subpart VV, § 60.485(b) (Test Methods And Procedures).

(II) The locations and identifiers of vents other than permanent roof fittings and seals, control device or controlled recovery system, and controlled exhaust stream(s) shall be recorded. There shall be no other gas/vapor flow out of the vapor space under the floating roof when the vapor space is directed to the control device. The vapor recovery system collection rate shall be no less than 100 cubic feet per minute when the tank is idle or the tank is being drained, and no less than two times the fill rate when the tank is being refilled.

(III) The control device shall be operated as required by this standard permit. If controlling through a fixed roof vent, emissions should be routed to control during the entire tank refill.

(IV) The roof shall be landed on its lowest legs or lowest suspension of the roof.

(ii) The occurrence of each roof landing and the associated emissions shall be recorded, and the rolling 12-month tank roof landing emissions shall be updated on a monthly basis. These records shall include at least the following information (as applicable):

(I) The identification of the tank and emission point number (EPN), and any control devices or controlled recovery systems used to reduce emissions;

(II) The reason for the tank roof landing;

(III) For the purpose of estimating emissions, the date, time, and other information specified for each of the following events:

(-a-) the roof was initially landed;

(-b-) all liquid was pumped from the tank to the extent practicable;

(-c-) refilling commenced, liquid filling the tank, and the volume necessary to float the roof; and

(-d-) tank roof floating on liquid.

(IV) The estimated quantity of each air contaminant, or mixture of air contaminants, emitted with the data and methods used to determine it. The emissions associated with roof landing activities shall be calculated using the methods described in AP 42 “Compilation of Air Pollution Emission Factors” and the standard permit registration.

(H) Pressurized tanks, which are storage vessels that operate at 15 psig above atmospheric pressure, and ISO containers shall be maintained such that there are no emissions of VOC to the atmosphere during routine operating conditions (including filling operations).

(i) The tank pressure shall not exceed that of any relief valve or rupture disk on the tank.

(ii) The safety relief or rupture disc shall be routed to a control device if safe as determined by the owner or operator at the site.

(16) **Capture Systems**

(A) Capture systems for control devices associated with facilities that are subject to the requirements under 30 TAC §122.604 (Compliance Assurance Monitoring Applicability) must comply with one of the following:

(i) Conduct a once a month AVO inspection of the capture system to verify there are no

leaking components in the capture system; or

(ii) Once a year, verify the capture system is leak-free by inspecting in accordance with 40 CFR Part 60, Appendix A-7, Test Method 21. Leaks shall be indicated by an instrument reading greater than or equal to 500 ppmv above background.

(B) Control devices shall not have a bypass unless uncontrolled emissions are represented in the registration.

(C) If there is a bypass for the control device, one of the following shall be implemented:

(i) Install a flow indicator that records and verifies zero flow at least once every 15 minutes immediately downstream of each valve that if opened would allow a vent stream to bypass the control device and be emitted, either directly or indirectly, to the atmosphere; or

(ii) Once a month, inspect the valves, verifying the position of the valves and the condition of the car seals to prevent flow out the bypass.

(D) A bypass does not include authorized analyzer vents, highpoint bleeder vents, low point drains, or rupture discs upstream of pressure relief valves if the pressure between the disc and relief valve is monitored and recorded at least weekly. A deviation shall be reported if the monitoring or inspections indicate bypass of the control device when it is required to be in service.

(E) Records of the inspections required shall be maintained and if the results of any of the above inspections are not satisfactory, prompt corrective action shall be taken.

(17) **Flares**

Flares shall be designed and operated in accordance with the following requirements:

(A) The flare systems shall be designed such that the combined assist natural gas or fuel gas (including refinery fuel gas) and waste stream to each flare meets the 40 CFR § 60.18 (General Control Device and Work Practice Requirements) specifications of minimum heating value and maximum tip velocity at all times when emissions may be vented to them. The heating value and velocity requirements shall be satisfied during operations. If required by an applicable NSPS, flare testing per 40 CFR § 60.18(f) shall be performed. Such flare testing may also be requested by the appropriate TCEQ Regional Office to demonstrate compliance with these requirements.

(B) The flare shall be operated with a flame present at all times and/or have a constant pilot flame. The pilot flame shall be continuously monitored by a thermocouple, infrared monitor, or ultraviolet monitor. The time, date, and duration of any loss of pilot flame shall be recorded. Each monitoring device shall be accurate to and shall be calibrated at a frequency in accordance with the manufacturer's specifications.

(C) The flare shall be operated with no visible emissions except periods not to exceed a total of five minutes during any two consecutive hours. This shall be ensured by the use of steam or air assist to the flare, if represented in the registration.

(D) A continuous flow monitor and composition analyzer (or calorimeter, if represented in the registration) shall be installed that provides a record of the vent stream flow and composition (or British thermal units (Btu) content if a calorimeter is installed) to the flare. The flow monitor sensor and analyzer sample points shall be installed in the vent stream as near as possible to the flare inlet such that the total vent stream to the flare is measured and analyzed. Readings shall be taken at least once every 15 minutes and the average hourly values of the flow and composition (or Btu content) shall be recorded each hour. The monitors shall be calibrated or have a calibration check performed on an annual basis to meet the following accuracy specifications: the flow monitor shall be ±5.0 percent, temperature monitor shall be ±2.0 percent at absolute temperature, and pressure monitor shall be ±5.0 millimeters of Mercury (mm Hg).

(E) Calibration of the VOC composition analyzer (if present) shall follow the procedures and requirements of Section 10.0 of 40 CFR Part 60, Appendix B, Performance Specification 9, as amended through October 17, 2000 (65 FR 61744), except that the multi-point calibration procedure in Section 10.1 of Performance Specification 9 shall be performed at least once every calendar quarter instead of once every month, and the mid-level calibration check procedure in Section 10.2 of Performance Specification 9 shall be performed at least once every calendar week instead of once every 24 hours. The calibration gases used for calibration procedures shall

be in accordance with Section 7.1 of Performance Specification 9. Net heating value of the gas combusted in the flare shall be calculated according to the equation given in 40 CFR § 60.18(f)(3).

(F) The calorimeter (if present) shall be calibrated, installed, operated, and maintained, in accordance with manufacturer recommendations, to continuously measure and record the net heating value of the gas sent to the flare, in Btu/standard cubic foot of the gas.

(G) As an alternative to installing a composition analyzer or calorimeter and all associated calibration requirements, the following method can be used to demonstrate compliance with the minimum heating value requirements of 40 CFR § 60.18: When material is being directed to the flare, the vent stream flow to the flare and the flow of assist gas shall be monitored and recorded at least once every 15 minutes. The flow data and assist gas net heating value shall be used to demonstrate compliance with 40 CFR § 60.18, assuming the waste gas has no heating value. Records shall be kept of vent stream flow and assist gas flow to the flare, and the calculated vent stream net heating value.

(H) The monitors and analyzers shall operate as required in paragraph (g)(17)(A) - (F) at least 95 percent of the time when the flare is operational, averaged over a rolling 12-month period. Unless complying with paragraph (g)(17)(G) as an alternative to (g)(17)(D), flared gas net heating value and actual exit velocity determined in accordance with 40 CFR § 60.18(f)(3) and (4) shall be recorded at least once every hour.

(I) If using a VOC composition analyzer, hourly mass emission rates shall be determined and recorded using flare readings and the emission factors used in the standard permit registration.

(J) Flow of waste gas to the flare shall be limited to the maximum hourly flow rate and total annual flow represented in the registration.

(K) Flare emissions shall be calculated on an hourly and annual average basis. TCEQ emission factors shall be used for NO_x and CO emissions from combustion of the waste stream, which may be found in Technical Supplement 4 of TCEQ Emissions Inventory Guidance RG-360. For SO_2 emissions from combustion of the waste stream, use mass balance and assume 100 percent conversion of sulfur. For pilot fuel and assist gas, the use of AP-42 emission factors is appropriate.

(L) For VOCs and other compounds to be combusted, the destruction efficiency for routine operation and planned MSS is 99 percent for compounds up to three carbons containing no elements other than carbon and hydrogen, in addition to methanol, ethanol, propanol, ethylene oxide, and propylene oxide. The destruction efficiency for routine operation and planned MSS is 98 percent for all other volatile compounds routed to the flare.

(18) **Vapor Combustion Units (VCUs)**

(A) VCUs shall be designed and operated in accordance with the following requirements:

(i) The VCU shall achieve a minimum destruction efficiency of 99 percent of the waste stream. This shall be ensured by maintaining the temperature in, or immediately downstream of, the combustion chamber above 1400 ºF prior to the initial stack test performed in accordance with the Initial Determination of Compliance in subsection (g)(6). Following the completion of that stack test, the six-minute average temperature shall be maintained above the minimum one-hour average temperature maintained during the last satisfactory stack test.

(ii) The temperature measurement device shall reduce the temperature readings to an averaging period of 6 minutes or less and record it at that frequency. The temperature monitor shall be installed, calibrated or have a calibration check performed at least annually, and maintained according to the manufacturer's specifications. The device shall have an accuracy of the greater of ±2 percent of the temperature being measured expressed in degrees Celsius or ±2.5°C.

(iii) Quality assured (or valid) data must be generated when the VCU is operating. Loss of valid data due to periods of monitor break down, out-of-control operation (producing inaccurate data), repair, maintenance, or calibration may be exempted provided it does not exceed five percent of the time (in minutes) that the VCU operated over the previous rolling 12-month period. The measurements missed shall be estimated using good

engineering judgment and the methods used recorded.

(iv) The VCU shall be operated with no visible emissions and have a constant pilot flame during all times waste gas could be directed to it. The pilot flame shall be continuously monitored by a thermocouple or an infrared monitor. The time, date, and duration of any loss of pilot flame shall be recorded. Each monitoring device shall be accurate to and shall be calibrated or have a calibration check performed at a frequency in accordance with, the manufacturer's specifications.

(B) VCU emissions shall be calculated on an hourly and annual average basis. For pilot fuel and assist gas, the use of AP-42 emission factors is appropriate. For SO_2 emissions from combustion of the waste stream, use mass balance and assume 100 percent conversion of sulfur.

(19) **Vapor Oxidizers**

Vapor oxidizers shall be designed and operated in accordance with the following requirements:

(A) Thermal, regenerative thermal, and catalytic oxidizers shall comply with one of the following: (1) maximum exhaust gas VOC concentration or (2) minimum VOC DRE listed in the following table.

Vapor oxidizer type	Maximum exhaust gas VOC concentration at 3 percent O_2 (ppmvd)	Minimum VOC DRE (percent)
Thermal oxidizer	10	99.9
Regenerative thermal oxidizer	10	99.0
Catalytic oxidizer	20	98.0

(B) NO_X emissions from thermal oxidizers shall not exceed 0.06 pounds (lb) NO_x per MMBtu.

(C) The vapor oxidizer exhaust temperature for thermal oxidizers shall be continuously monitored and recorded when waste gas is directed to the oxidizer. For thermal oxidizers and regenerative thermal oxidizers, the oxidizer firebox temperature shall be maintained at a minimum of 1400 °F and exhaust oxygen concentration at a minimum of three percent on a six-minute average while waste gas is being fed into the oxidizer prior to initial stack testing. After the initial stack test has been completed, the six-minute average temperature shall be greater than or equal to the respective hourly average maintained during the most recent satisfactory stack testing required by the Initial Demonstration of Compliance in subsection (g)(6).

(D) For catalytic oxidizers, the temperature of the gas stream before and after the catalyst bed shall be continuously monitored and recorded when waste gas is directed to the catalytic oxidizer. The temperature measurement devices shall reduce the temperature readings to an averaging period of six minutes or less and record it at that frequency. The minimum inlet temperature shall be maintained at the temperature between 600 °F – 800 °F, and consistent with the registration representation, when waste gas is being directed to the catalytic oxidizer. Retesting may require a change in the minimum inlet temperature value to demonstrate 98 percent DRE for the incoming VOC.

(E) The temperature measurement device shall be installed, calibrated, and maintained according to accepted practice and the manufacturer's specifications. The device shall have an accuracy of the greater of ±0.75 percent of the temperature being measured expressed in degrees Celsius or ±2.5 °C. Quality assured (or valid) data must be generated when the vapor oxidizer is operating. Loss of valid data due to periods of monitor break down, out-of-control operation (producing inaccurate data), repair, maintenance, or calibration may be exempted provided it does not exceed five percent of the time (in minutes) that the vapor oxidizer operated over the previous rolling 12-month period. The measurements missed shall be estimated using good engineering judgment and the methods used recorded.

(F) The exit temperature of any stand-by oxidizer firebox shall be maintained at a minimum of 800 °F, and consistent with the registration representation.

(G) For regenerative thermal oxidizers, catalytic oxidizers emitting less than two tpy VOC, and thermal oxidizers emitting less than 10 tpy VOC, the use of an oxygen analyzer shall be

Table 2a Region 10 Impacts 1-hr Averaging Time, X_i, ($\mu g/m^3$ per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 feet (ft) height	3584.7	2448	1279.3	765.8	553.5	419.8	336.3	209.6	145.4
Fixed or Floating Roof Tank 30 ft height	721.1	615	465.5	258.6	184.9	146.9	124.1	91.84	77.91
Fixed or Floating Roof Tank 35 ft height	570	464.2	375.9	222.5	159.8	136.3	118.7	88.26	72.42
Fixed or Floating Roof Tank 40 ft height	470	363.1	308.3	192.1	138.2	126.7	113.8	85.31	69.83
Fixed or Floating Roof Tank 45 ft height	405.8	293.5	254.8	167.3	121.9	118.7	109.6	82.82	67.63
Fixed or Floating Roof Tank 50 ft height	363.3	243.8	213.4	148.6	113.2	112.6	106	80.67	65.73
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	21023.6	11972.4	5342.9	2116.6	1209.1	810.7	599	340.8	227.1
VCU or VO 40 ft height	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.35
VCU or VO 50 ft height	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.83
VCU or VO 60 ft height	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
Flare 30 ft height	9.87	9.87	9.87	9.87	9.87	9.87	9.87	8.16	6.45
Flare 40 ft height	6.98	6.98	6.98	6.98	6.98	6.98	6.37	5.88	5.07
Flare 50 ft height	5.41	5.41	5.41	5.41	5.41	5.41	5.27	4.15	3.93
Emergency Engine 8 ft height	223.2	223.2	223.2	166.2	120.2	107	97.64	69.97	55.04
Emergency Engine 12 ft height	117	117	117	113.6	96.28	90.87	86.74	62.83	50.79
Truck Loading	6452.3	3975.5	2082.7	1227.1	796	563	429	252.7	170.3
Railcar Loading	3990.4	3123.6	1588.9	967.2	673.3	494.5	385.1	232.2	158
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	21386.9	12210.6	5453.7	2135.7	1215.5	813.6	600.6	341.3	227.3
Heater	43.8	43.8	43.8	41.57	28.92	21.84	17.13	10.61	7.57
Boiler	12.18	12.18	12.18	12.18	12.18	11.89	11.14	8.38	6.48
Temporary Control Device (excluding temporary CAS) 12 ft height	53.12	53.12	53.12	48.71	32.13	23.25	17.93	11.01	7.84
Temporary Control Device (excluding temporary CAS) 20 ft height	21.25	21.25	21.25	21.25	19.94	16.53	13.76	9.15	6.67
Vacuum Trucks	3584.7	2448	1279.3	765.8	553.5	419.8	336.3	209.6	145.4

Table 2b Region 10 Impacts 3-hr Averaging Time, X_i, (µg/m^3 per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	2065.7	1493.7	1032.8	708.2	496.5	368.2	286.8	176.9	123
Fixed or Floating Roof Tank 30 ft height	597.4	357.7	248.9	154.8	117.3	107.1	103.1	83.99	70.21
Fixed or Floating Roof Tank 35 ft height	509.8	287.7	195	125.4	89.08	76.36	75.31	64.57	55.02
Fixed or Floating Roof Tank 40 ft height	444.4	240.3	157.7	104.8	74.48	57.59	56.19	49.21	43.3
Fixed or Floating Roof Tank 45 ft height	394.8	206.6	131.3	90.52	64.03	49.17	43.3	37.87	34.06
Fixed or Floating Roof Tank 50 ft height	355.3	181.4	111.8	78.7	56.03	43.4	39.84	29.74	27.21
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	18555.7	10871.2	4736.4	1821.4	1024.2	680.4	494.3	285.3	185.1
VCU or VO 40 ft height	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.29
VCU or VO 50 ft height	1.79	1.79	1.79	1.79	1.79	1.79	1.79	1.79	1.76
VCU or VO 60 ft height	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28
Flare 30 ft height	9.21	9.21	9.21	9.21	9.21	9.21	9.21	7.87	6.29
Flare 40 ft height	5.58	5.58	5.58	5.58	5.58	5.58	5.58	5.32	4.77
Flare 50 ft height	4.56	4.56	4.56	4.56	4.56	4.56	4.56	3.73	3.42
Emergency Engine 8 ft height	213.9	213.9	213.9	161.5	110.9	85.98	76.04	59.87	51.51
Emergency Engine 12 ft height	107.9	107.9	107.9	107.4	82.94	67.75	62.09	51.2	45.55
Truck Loading	2479.2	1969.3	1860.9	1098.7	694.3	484.3	361.7	212.3	142.1
Railcar Loading	1383.6	1336.8	1164.1	884.4	595.6	429.1	326.3	195.2	132.6
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	15962.3	11085.3	4832.9	1837.3	1029.4	682.7	495.6	285.7	185.3
Heater	43.07	43.07	43.07	39.6	27.33	21.4	17	10.57	7.39
Boiler	11.73	11.73	11.73	11.73	11.73	11.13	10.86	8.28	6.36
Temporary Control Device (excluding temporary CAS) 12 ft height	52.1	52.1	52.1	46.56	30.5	22.85	17.87	10.98	7.69
Temporary Control Device (excluding temporary CAS) 20 ft height	19.79	19.79	19.79	19.79	18.99	15.64	13.51	9.07	6.59
Vacuum Trucks	2065.7	1493.7	1032.8	708.2	496.5	368.2	286.8	176.9	123

Table 2c Region 10 Impacts 8-hr Averaging Time, X_i, (µg/m^3 per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	1550.1	1082.5	852.8	562.7	383.1	277.1	210.5	124.4	87.13
Fixed or Floating Roof Tank 30 ft height	509	270.9	159.4	108.2	91.24	81.23	73.43	58.3	47.82
Fixed or Floating Roof Tank 35 ft height	429.9	224.4	126.4	80.27	65.74	58.25	53.12	44.03	37.94
Fixed or Floating Roof Tank 40 ft height	371	191.3	104.7	63.21	50.05	43.64	39.62	33.36	29.8
Fixed or Floating Roof Tank 45 ft height	326.5	166.9	89.5	52.6	40.1	34.16	30.67	25.87	23.48
Fixed or Floating Roof Tank 50 ft height	291.1	148	78.23	44.84	33.95	27.75	24.58	20.55	18.72
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	15313.5	8655.8	3532.7	1273.3	688.9	445.6	317.9	182.2	124.1
VCU or VO 40 ft height	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.51	1.34
VCU or VO 50 ft height	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.04
VCU or VO 60 ft height	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Flare 30 ft height	8.88	8.88	8.88	8.88	8.88	8.88	8.88	7.68	6.06
Flare 40 ft height	5.11	5.11	5.11	5.11	5.11	5.11	5.11	5.04	4.63
Flare 50 ft height	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.29	3.26
Emergency Engine 8 ft height	210.3	210.3	210.3	158.1	103.9	75.59	64.82	45.38	37.87
Emergency Engine 12 ft height	105.8	105.8	105.8	103.3	80.01	61.86	53.92	39.57	33.46
Truck Loading	1472.7	1472.7	1472.7	850.5	513.8	347.8	254	145.5	99.77
Railcar Loading	871.9	871.9	871.9	693.1	452.1	315.9	234.6	135.6	93.66
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	12038.4	8841.7	3601.4	1283.8	692.1	447	318.6	182.4	124.3
Heater	26.56	26.56	26.56	26.56	23.63	19.67	15.99	10.07	7
Boiler	10.36	10.36	10.36	10.36	10.36	10.36	10.36	7.89	6.1
Temporary Control Device (excluding temporary CAS) 12 ft height	32.92	32.92	32.92	32.92	26.42	21.18	16.78	10.64	7.3
Temporary Control Device (excluding temporary CAS) 20 ft height	14.75	14.75	14.75	14.75	14.75	13.64	12.7	8.65	6.42
Vacuum Trucks	1550.1	1082.5	852.8	562.7	383.1	277.1	210.5	124.4	87.13

Table 2d Region 10 Impacts 24-hr Averaging Time, X_i, (µg/m^3 per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	753.6	532.7	400.1	236.8	154.1	108.8	81.25	46.12	31.88
Fixed or Floating Roof Tank 30 ft height	243.2	129.5	79.31	56.66	46.54	39.22	33.55	24.03	18.41
Fixed or Floating Roof Tank 35 ft height	205.2	107	62.53	42.63	35.08	29.95	26.03	19.54	15.49
Fixed or Floating Roof Tank 40 ft height	176.9	91.08	51.5	33.99	27.48	23.68	20.58	15.88	12.9
Fixed or Floating Roof Tank 45 ft height	155.6	79.4	43.85	28.05	22.34	19.51	17.05	13	10.73
Fixed or Floating Roof Tank 50 ft height	138.8	70.36	38.19	23.74	18.56	16.32	14.42	10.79	8.97
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	6849	3675.9	1409	484	251.8	160.3	114.5	66.57	45.33
VCU or VO 40 ft height	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
VCU or VO 50 ft height	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
VCU or VO 60 ft height	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Flare 30 ft height	5.89	5.89	5.89	5.89	5.89	5.89	5.89	5.47	4.24
Flare 40 ft height	3.71	3.71	3.71	3.71	3.71	3.71	3.71	3.71	3.32
Flare 50 ft height	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45
Emergency Engine 8 ft height	149.5	149.5	149.5	111.8	77.71	56.35	42.1	25.66	19.82
Emergency Engine 12 ft height	77.44	77.44	77.44	77.44	59.41	47.63	37.42	22.72	18.18
Truck Loading	666.1	666.1	666.1	343.2	200.9	133.2	95.56	53.22	36.48
Railcar Loading	430.2	430.2	430.2	285.7	179.2	122.5	89.49	49.61	34.26
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	5672.9	3758.9	1435	487.7	252.9	160.8	114.7	66.66	45.38
Heater	15.22	15.22	15.22	15.22	15.15	12.23	9.61	6.85	4.82
Boiler	6.8	6.8	6.8	6.8	6.8	6.8	6.37	5.55	4.26
Temporary Control Device (excluding temporary CAS) 12 ft height	18.43	18.43	18.43	18.43	16.99	13.03	10.53	7.2	4.98
Temporary Control Device (excluding temporary CAS) 20 ft height	9.15	9.15	9.15	9.15	9.15	9.15	7.7	5.84	4.37
Vacuum Trucks	753.6	532.7	400.1	236.8	154.1	108.8	81.25	46.12	31.88

Table 2e Region 10 Impacts Annual Averaging Time, X_i, ($\mu g/m^3$ per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	148.7	105.8	78.34	41.51	24.24	15.8	11.42	5.95	3.71
Fixed or Floating Roof Tank 30 ft height	44.75	24.51	15.35	11.11	8.82	7.05	5.74	3.71	2.62
Fixed or Floating Roof Tank 35 ft height	37	19.83	11.86	8.33	6.76	5.56	4.62	3.1	2.27
Fixed or Floating Roof Tank 40 ft height	31.37	16.57	9.59	6.51	5.32	4.46	3.77	2.61	1.95
Fixed or Floating Roof Tank 45 ft height	27.18	14.22	8.02	5.28	4.31	3.65	3.12	2.21	1.68
Fixed or Floating Roof Tank 50 ft height	23.92	12.42	6.87	4.39	3.57	3.04	2.63	1.89	1.45
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	1302.2	650.2	221	66.01	32.19	19.35	13.36	6.57	4
VCU or VO 40 ft height	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
VCU or VO 50 ft height	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
VCU or VO 60 ft height	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Flare 30 ft height	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.57	0.49
Flare 40 ft height	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.41	0.37
Flare 50 ft height	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.29
Emergency Engine 8 ft height	17.13	17.13	17.13	17.13	12.14	8.83	6.71	3.91	2.66
Emergency Engine 12 ft height	11.28	11.28	11.28	11.28	9.53	7.44	5.88	3.59	2.48
Truck Loading	131.6	131.6	125.9	54.4	28.71	17.81	12.55	6.3	3.87
Railcar Loading	87.66	87.66	87.66	48.25	26.87	17.03	12.12	6.17	3.81
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	1078.2	666.3	224.6	66.41	32.29	19.39	13.38	6.57	4.01
Heater	0.84	0.84	0.84	0.84	0.84	0.82	0.76	0.57	0.44
Boiler	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.52	0.44
Temporary Control Device (excluding temporary CAS) 12 ft height	0.97	0.97	0.97	0.97	0.97	0.92	0.82	0.6	0.47
Temporary Control Device (excluding temporary CAS) 20 ft height	0.63	0.63	0.63	0.63	0.63	0.63	0.62	0.5	0.41
Vacuum Trucks	148.7	105.8	78.34	41.51	24.24	15.8	11.42	5.95	3.71

Table 2f Region 10 Marine Loading Impacts at 25 Meters with 1-Hr and Annual Averaging Time, (µg/m^3 per lb/hr)

Emission Point	1-hr	Annual
Barge Loading Vent 10 ft	1929.4	84.68
Barge Loading Vent 15 ft	1286.1	33.14
Barge Loading Vent 20 ft	930.1	15.53
Ship Loading Vent 30 ft	492.4	5.37
Ship Loading Vent 40 ft	262.9	2.39
Ship Loading Vent 50 ft	176	1.29

Table 3a Region 12 Impacts 1-hr Averaging Time, X_i, ($\mu g/m^3$ per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	3291.4	2150.7	1181.2	604.9	379.9	265.1	198.6	115.8	78.37
Fixed or Floating Roof Tank 30 ft height	705.6	597.4	425.3	237.7	169.2	139.1	115.6	84.32	65.95
Fixed or Floating Roof Tank 35 ft height	558.3	453	352.5	202.9	137.5	114.3	98.15	71.26	58.3
Fixed or Floating Roof Tank 40 ft height	461.9	355.1	293.8	175.1	121.4	91.81	82.27	60.73	49.68
Fixed or Floating Roof Tank 45 ft height	399.6	287.3	245.8	152.2	106.5	81.5	67.67	53.54	42.43
Fixed or Floating Roof Tank 50 ft height	355.7	239	206.6	134.9	96.12	73.67	58.47	46.22	37.91
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	19151.2	8665.4	3159.7	1154.8	644.7	427.2	311.1	175.5	117.2
VCU or VO 40 ft height	4.4	4.4	4.4	4.4	4.4	4.4	4.04	2.68	1.96
VCU or VO 50 ft height	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.25	1.73
VCU or VO 60 ft height	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.82	1.46
Flare 30 ft height	12	12	12	12	12	11.75	10.53	7.6	5.86
Flare 40 ft height	7.29	7.29	7.29	7.29	7.29	7.24	7.24	6.12	4.84
Flare 50 ft height	5.8	5.8	5.8	5.8	5.8	5.69	5.09	4.72	4.03
Emergency Engine 8 ft height	270.4	270.4	252.4	136.4	101.2	88.36	76.33	54.66	42.75
Emergency Engine 12 ft height	145.7	145.7	145.7	108.7	88.99	80.4	71.74	51.76	40.93
Truck Loading	5744.7	3518.2	1845	806.5	469.9	316.7	232.6	132.5	88.81
Railcar Loading	3823.4	2711.6	1470.8	710.1	427.2	291.7	215.7	123.9	83.27
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	19869	8869.9	3191.8	1159.1	646	427.8	311.4	175.6	117.3
Heater	55.08	55.08	55.08	35.26	23.39	17.09	13.27	8.22	5.85
Boiler	14.69	14.69	14.69	14.69	14.2	12.38	10.61	7.37	5.57
Temporary Control Device (excluding temporary CAS) 12 ft height	68.36	68.36	68.36	37.87	24.81	18.1	14.09	8.68	6.13
Temporary Control Device (excluding temporary CAS) 20 ft height	25.84	25.84	25.84	24.21	18.42	14.23	11.58	7.6	5.55
Vacuum Trucks	3291.4	2150.7	1181.2	604.9	379.9	265.1	198.6	115.8	78.37

Table 3b Region 12 Impacts 3-hr Averaging Time, X_i, (µg/m^3 per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	2148.5	1558.7	1127.8	596.9	369.3	255.5	190.3	110	74.12
Fixed or Floating Roof Tank 30 ft height	587.6	362.5	257.9	165.1	142.6	123.8	108.5	79.12	60.64
Fixed or Floating Roof Tank 35 ft height	500.8	283	201.6	127.3	105.3	94.62	85.48	66.93	53.88
Fixed or Floating Roof Tank 40 ft height	436.6	232.3	161.7	103.2	79.15	71.99	66.42	55.07	46.07
Fixed or Floating Roof Tank 45 ft height	388.3	203.6	132.6	87.14	64.24	56.28	51.96	44.39	38.56
Fixed or Floating Roof Tank 50 ft height	349.5	181.7	110.9	74.93	54.79	44.91	41.99	36.09	32.12
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	18340.3	8295.5	3075	1108.2	614.7	405.6	294.4	165.2	109.8
VCU or VO 40 ft height	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.47	1.87
VCU or VO 50 ft height	2.03	2.03	2.03	2.03	2.03	2.03	2.03	1.97	1.62
VCU or VO 60 ft height	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.37
Flare 30 ft height	11.54	11.54	11.54	11.54	11.54	11.27	10.16	7.53	5.82
Flare 40 ft height	6.76	6.76	6.76	6.76	6.76	6.76	6.76	5.8	4.73
Flare 50 ft height	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.28	3.76
Emergency Engine 8 ft height	265	265	247.2	134	87.19	69.23	60.44	47.27	39.53
Emergency Engine 12 ft height	141	141	141	105.8	73.99	61.57	54.52	44.11	37.85
Truck Loading	2533	2533	1813.4	785.8	453	303.4	221.9	125.6	83.86
Railcar Loading	1572.1	1572.1	1403.4	696.2	413.4	280.2	206.2	117.5	78.69
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	18221.4	8492.4	3105.8	1112.3	615.9	406.1	294.7	165.2	109.8
Heater	47.42	47.42	47.42	34.65	22.78	16.79	13.01	8.05	5.71
Boiler	14.2	14.2	14.2	14.2	14.08	11.93	10.39	7.23	5.46
Temporary Control Device (excluding temporary CAS) 12 ft height	60.4	60.4	60.4	37.62	24.53	17.8	13.88	8.51	6.03
Temporary Control Device (excluding temporary CAS) 20 ft height	23.61	23.61	257.9	22.64	18.26	14.04	11.53	7.55	5.49
Vacuum Trucks	2148.5	1558.7	1127.8	596.9	369.3	255.5	190.3	110	74.12

Table 3c Region 12 Impacts 8-Hr Averaging Time, X_i, (µg/m^3 per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	1741.9	1372.4	949.3	488.3	294.3	199.7	148.8	83.18	56.22
Fixed or Floating Roof Tank 30 ft height	492	287.9	196.8	142.2	114.2	95.61	86.84	62.95	47.46
Fixed or Floating Roof Tank 35 ft height	413.7	231.1	149.4	106.1	86.17	73.51	68.53	53.51	42.44
Fixed or Floating Roof Tank 40 ft height	356.1	193.8	119.4	82.37	66.59	57.22	53.06	43.83	36.4
Fixed or Floating Roof Tank 45 ft height	312.9	167.5	99.07	66.41	53.1	45.43	42.41	35.2	30.34
Fixed or Floating Roof Tank 50 ft height	279.7	147.6	84.63	55.13	43.61	36.99	34.57	28.15	24.87
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	15485.6	6759.7	2399	819.8	435	277.7	201.8	108.1	73.22
VCU or VO 40 ft height	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.48
VCU or VO 50 ft height	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
VCU or VO 60 ft height	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Flare 30 ft height	11.09	11.09	11.09	11.09	11.09	10.97	9.8	7.2	5.53
Flare 40 ft height	6.57	6.57	6.57	6.57	6.57	6.57	6.57	5.59	4.57
Flare 50 ft height	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.12	3.61
Emergency Engine 8 ft height	245	245	240	125.1	80.8	64.04	51.36	38.16	30.59
Emergency Engine 12 ft height	135.4	135.4	135.4	101.3	68.73	57.39	47.71	35.91	29.44
Truck Loading	2213.2	2213.2	1500.2	627.7	350.7	229.7	167.9	91.44	61.43
Railcar Loading	1246.3	1246.3	1173.8	563.7	325.4	216	159	87.41	58.78
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	15382.5	6919.1	2422.9	822.8	435.9	278.1	202	108.2	73.25
Heater	33.73	33.73	33.73	31.82	21.2	15.65	12.37	7.59	5.42
Boiler	12.82	12.82	12.82	12.82	12.82	11.44	9.77	6.81	5.19
Temporary Control Device (excluding temporary CAS) 12 ft height	40.6	40.6	40.6	34.4	23.84	17.03	13.49	8.22	5.71
Temporary Control Device (excluding temporary CAS) 20 ft height	19.78	19.78	19.78	19.78	16.66	13.73	10.93	7.23	5.26
Vacuum Trucks	1741.9	1372.4	949.3	488.3	294.3	199.7	148.8	83.18	56.22

Table 3d Region 12 Impacts 24-Hr Averaging Time, X_i, ($\mu g/m^3$ per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	856.5	663.7	445.7	213.3	123.9	81.94	58.92	31.92	20.52
Fixed or Floating Roof Tank 30 ft height	241.3	137.9	90.51	66.96	53.56	44.13	36.84	24.78	17.83
Fixed or Floating Roof Tank 35 ft height	201.3	111	68.48	50.07	40.35	34.01	29.61	21.22	15.97
Fixed or Floating Roof Tank 40 ft height	172	92.63	54.61	38.78	31.67	26.56	24.14	17.67	13.89
Fixed or Floating Roof Tank 45 ft height	150.1	79.58	45.34	31.08	25.42	21.53	19.79	14.78	11.81
Fixed or Floating Roof Tank 50 ft height	132.9	67.68	38.7	25.65	20.87	17.75	16.38	12.41	10.05
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	7175.2	3010.9	1011.4	325.7	167.9	105.3	74.94	39.28	25.29
VCU or VO 40 ft height	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.79
VCU or VO 50 ft height	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.67
VCU or VO 60 ft height	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
Flare 30 ft height	8.65	8.65	8.65	8.65	8.65	8.22	7.89	5.67	4.06
Flare 40 ft height	5.09	5.09	5.09	5.09	5.09	5.09	5.09	4.57	3.5
Flare 50 ft height	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	2.94
Emergency Engine 8 ft height	181.2	181.2	181.2	88.57	52	38.06	30.17	19.3	14.23
Emergency Engine 12 ft height	103.1	103.1	103.1	71.16	46.68	34.48	28.18	18.26	13.76
Truck Loading	1054.8	1054.8	679.2	265.4	143.3	91.7	64.69	34.22	21.77
Railcar Loading	594.2	594.2	543.9	242.4	135	87.46	62.13	33.15	21.17
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	7148.5	3080.6	1021.1	326.8	168.2	105.4	75	39.29	25.3
Heater	19.67	19.67	19.67	19.09	15.63	11.48	9.09	5.87	3.97
Boiler	9.33	9.33	9.33	9.33	9.33	8.51	7.48	5.47	3.86
Temporary Control Device (excluding temporary CAS) 12 ft height	23.37	23.37	23.37	22.12	16.66	12.23	9.9	6.1	4.06
Temporary Control Device (excluding temporary CAS) 20 ft height	11.82	11.82	11.82	11.82	11.82	9.74	8.05	5.57	3.87
Vacuum Trucks	856.5	663.7	445.7	213.3	123.9	81.94	58.92	31.92	20.52

Table 3e Region 12 Impacts Annual Averaging Time, X_i, ($\mu g/m^3$ per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	236.6	183.7	115.4	48.68	26.23	16.5	11.73	5.98	3.69
Fixed or Floating Roof Tank 30 ft height	60.29	35.06	24.18	17.38	12.88	9.77	7.76	4.68	3.15
Fixed or Floating Roof Tank 35 ft height	49.26	27.59	17.99	12.99	10.05	7.91	6.45	4.11	2.87
Fixed or Floating Roof Tank 40 ft height	41.43	22.63	14.09	10.03	7.94	6.42	5.33	3.55	2.56
Fixed or Floating Roof Tank 45 ft height	35.68	19.15	11.5	8	6.4	5.26	4.41	3.04	2.25
Fixed or Floating Roof Tank 50 ft height	31.25	16.56	9.66	6.55	5.26	4.36	3.69	2.6	1.97
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	1837	711.6	217.2	63.44	30.95	18.65	12.92	6.37	3.87
VCU or VO 40 ft height	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
VCU or VO 50 ft height	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
VCU or VO 60 ft height	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Flare 30 ft height	1.17	1.17	1.17	1.17	1.17	1.17	1.17	0.92	0.71
Flare 40 ft height	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.71	0.59
Flare 50 ft height	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.48
Emergency Engine 8 ft height	36.7	36.7	36.7	20.73	12.66	8.64	6.52	3.89	2.69
Emergency Engine 12 ft height	19.48	19.48	19.48	16.91	11.26	7.97	6.07	3.7	2.58
Truck Loading	292.9	292.9	164.3	56.85	28.79	17.62	12.36	6.18	3.78
Railcar Loading	159.5	166.4	138.1	53.56	27.81	17.19	12.12	6.1	3.74
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	1842	727.1	219	63.62	30.99	18.67	12.93	6.37	3.87
Heater	1.49	1.49	1.49	1.49	1.48	1.33	1.19	0.83	0.6
Boiler	1.07	1.07	1.07	1.07	1.07	1.07	1.07	0.84	0.64
Temporary Control Device (excluding temporary CAS) 12 ft height	1.8	1.8	1.8	1.8	1.72	1.47	1.29	0.87	0.63
Temporary Control Device (excluding temporary CAS) 20 ft height	1.14	1.14	1.14	1.14	1.14	1.13	1.07	0.79	0.59
Vacuum Trucks	236.6	183.7	115.4	48.68	26.23	16.5	11.73	5.98	3.69

Table 3f Region 12 Marine Loading Impacts at 25 Meters with 1-Hr and Annual Averaging Time, (µg/m^3 per lb/hr)

Emission Point	1-hr	Annual
Barge Loading Vent 10 ft	1694.7	165.2
Barge Loading Vent 15 ft	1130.9	71.09
Barge Loading Vent 20 ft	829.7	33.98
Ship Loading Vent 30 ft	476.7	10.09
Ship Loading Vent 40 ft	245.2	4.49
Ship Loading Vent 50 ft	152.6	2.35

Table 4a Region 14 Impacts 1-Hr Averaging Time, X_i, (µg/m^3 per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	3156.5	2165.2	1171.3	646.4	412	290.2	220.4	129.1	87.88
Fixed or Floating Roof Tank 30 ft height	675.5	545	434.5	237.1	156.7	132.2	117.5	86.3	69.23
Fixed or Floating Roof Tank 35 ft height	542.9	409.4	346.1	199.8	134.3	104.1	96.65	71.56	60.15
Fixed or Floating Roof Tank 40 ft height	454.2	321.4	276.9	175.3	120.4	86.21	79.42	60.31	49.97
Fixed or Floating Roof Tank 45 ft height	396.1	262.5	224.3	156.6	106.9	79.62	64.62	51.84	42.27
Fixed or Floating Roof Tank 50 ft height	356.8	221.3	184.7	139	94.14	73.01	57.58	44.15	35.96
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	18973.3	9165.8	3520.6	1290.7	719.6	477.9	348	196.7	132.7
VCU or VO 40 ft height	4.93	4.93	4.93	4.93	4.93	4.86	4.21	2.84	2.05
VCU or VO 50 ft height	3.03	3.03	3.03	3.03	3.03	3.03	3.03	2.31	1.78
VCU or VO 60 ft height	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.82	1.51
Flare 30 ft height	11.67	11.67	11.67	11.67	11.67	11.6	10.54	7.75	6
Flare 40 ft height	7.23	7.23	7.23	7.23	7.23	7.05	7.05	6.1	4.91
Flare 50 ft height	5.59	5.59	5.59	5.59	5.59	5.55	5.2	4.64	4.08
Emergency Engine 8 ft height	262	262	251.9	142.7	105	90.55	77.15	57.99	44.38
Emergency Engine 12 ft height	140.5	140.5	140.5	110.5	89.48	82.15	70.53	55.02	42.14
Truck Loading	5397.4	3500.7	1925.6	884.5	518.7	351.3	260.2	148.2	100.2
Railcar Loading	3232.7	2697.3	1456.7	768.9	468.2	321.9	240.7	138.4	93.65
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	19161.3	9398	3560.9	1296.4	721.4	478.7	348.4	196.9	132.8
Heater	57.43	57.43	57.43	36.99	24.73	17.97	13.98	8.64	6.13
Boiler	14.4	14.4	14.4	14.4	14.37	12.63	10.82	7.58	5.73
Temporary Control Device (excluding temporary CAS) 12 ft height	76.82	76.82	72.68	40.2	25.87	18.93	14.75	9.12	6.44
Temporary Control Device (excluding temporary CAS) 20 ft height	25.33	25.33	25.33	24.54	19.04	14.81	11.93	7.9	5.76
Vacuum Trucks	3156.5	2165.2	1171.3	646.4	412	290.2	220.4	129.1	87.88

Table 4b Region 14 Impacts 3-Hr Averaging Time, X_i, (µg/m^3 per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	1766.1	1363.6	1010.4	549.9	343.1	237.9	184.9	106.7	73.56
Fixed or Floating Roof Tank 30 ft height	535.9	296.4	187.6	140.5	120.5	105.2	96.2	71	55.64
Fixed or Floating Roof Tank 35 ft height	452.6	242.9	148.1	102.3	87.88	77.98	73.71	58.25	47.97
Fixed or Floating Roof Tank 40 ft height	391.1	206	119.1	81.71	66	58.61	56.34	46.68	40.13
Fixed or Floating Roof Tank 45 ft height	344.8	179.9	99.87	68.92	51.66	45.25	43.68	37.12	32.97
Fixed or Floating Roof Tank 50 ft height	308	160	86.84	58.36	45.66	36.03	34.64	29.65	26.89
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	16696.9	7750.7	2881.7	1016.1	550.4	357	278	153.2	105.9
VCU or VO 40 ft height	3.63	3.63	3.63	3.63	3.63	3.63	3.63	2.79	2.04
VCU or VO 50 ft height	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.25	1.78
VCU or VO 60 ft height	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.67	1.51
Flare 30 ft height	11.26	11.26	11.26	11.26	11.26	11.08	10.14	7.59	5.94
Flare 40 ft height	6.55	6.55	6.55	6.55	6.55	6.55	6.55	5.76	4.75
Flare 50 ft height	4.61	4.61	4.61	4.61	4.61	4.61	4.54	4.26	3.71
Emergency Engine 8 ft height	255.2	255.2	246.4	140	90.67	72.19	61.86	48.77	39.95
Emergency Engine 12 ft height	135.3	135.3	135.3	108.4	77.21	62.52	55.07	44.78	37.74
Truck Loading	2290.8	2027.9	1653.3	735.4	422.2	281.4	215.6	121.1	82.89
Railcar Loading	1283.4	1241.4	1241.4	647.3	385.8	261.1	200.8	113.9	78.03
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	16174.3	7945.6	2914.4	1020.4	551.7	357.6	278.4	153.3	106
Heater	52	52	52	36.52	24.39	17.7	13.8	8.43	6.02
Boiler	14.1	14.1	14.1	14.1	13.99	12.33	10.61	7.45	5.65
Temporary Control Device (excluding temporary CAS) 12 ft height	68.02	68.02	68.02	39.91	25.74	18.83	14.6	8.9	6.36
Temporary Control Device (excluding temporary CAS) 20 ft height	25.24	25.24	25.24	24.36	18.82	14.71	11.82	7.8	5.69
Vacuum Trucks	1766.1	1363.6	1010.4	549.9	343.1	237.9	184.9	106.7	73.56

Table 4c Region 14 Impacts 8-Hr Averaging Time, X_i, (µg/m^3 per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	1212.7	934.2	634.2	318.8	195.1	133.2	99.2	55.9	37.25
Fixed or Floating Roof Tank 30 ft height	346	203.4	139.6	92.43	73.5	62.56	54.09	37.62	28.86
Fixed or Floating Roof Tank 35 ft height	288.9	163.6	107.8	70.86	54.51	47.56	42.27	31.68	24.96
Fixed or Floating Roof Tank 40 ft height	247	136.1	86.5	56.6	42.32	36.47	32.8	26.02	21.06
Fixed or Floating Roof Tank 45 ft height	215.8	116.6	71.8	46.71	34.66	28.6	26.01	21.11	17.68
Fixed or Floating Roof Tank 50 ft height	191.4	101.9	61.12	39.48	29.21	23.34	20.91	17.11	14.7
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	10374.1	4608.6	1622.6	562.6	305.5	198.4	142.1	77.67	50.62
VCU or VO 40 ft height	3.21	3.21	3.21	3.21	3.21	3.21	3.21	2.55	1.9
VCU or VO 50 ft height	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.01	1.65
VCU or VO 60 ft height	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.5	1.38
Flare 30 ft height	10.98	10.98	10.98	10.98	10.98	10.75	9.78	7.33	5.64
Flare 40 ft height	6.39	6.39	6.39	6.39	6.39	6.39	6.39	5.49	4.61
Flare 50 ft height	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.04	3.57
Emergency Engine 8 ft height	242.1	242.1	237.3	135.5	81.84	60.16	50.02	34.03	25.56
Emergency Engine 12 ft height	131.8	131.8	131.8	103.9	72.25	53.35	45.08	31.89	24.52
Truck Loading	1416	1416	999.3	418.3	236	156	113	62.68	41.22
Railcar Loading	810.5	810.5	772.3	371.5	217.7	145.2	106.1	59.3	39.16
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	10087.3	4724.3	1641.3	564.9	306.3	198.7	142.3	77.72	50.64
Heater	45.99	45.99	45.99	35.03	23.71	16.92	12.97	7.72	5.66
Boiler	13.52	13.52	13.52	13.52	13.52	11.99	10.11	6.87	5.3
Temporary Control Device (excluding temporary CAS) 12 ft height	61.88	61.88	61.88	38.66	25	18.14	14.04	8.55	6.05
Temporary Control Device (excluding temporary CAS) 20 ft height	23.72	23.72	23.72	23.27	18.61	14.22	11.46	7.33	5.47
Vacuum Trucks	1212.7	934.2	634.2	318.8	195.1	133.2	99.2	55.9	37.25

Table 4d Region 14 Impacts 24-Hr Averaging Time, X_i, ($\mu g/m^3$ per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	629.3	488.5	337.1	158.6	90.83	60.33	45.27	24.48	15.87
Fixed or Floating Roof Tank 30 ft height	182	103.4	70.44	51.93	40.71	32.7	26.81	17.67	12.62
Fixed or Floating Roof Tank 35 ft height	151.8	83.72	53.78	38.93	31.29	25.92	21.88	15.26	11.34
Fixed or Floating Roof Tank 40 ft height	130	70.38	43.15	30.3	24.52	20.62	17.72	12.89	9.91
Fixed or Floating Roof Tank 45 ft height	114.3	60.85	35.98	24.44	19.71	16.66	14.66	10.78	8.52
Fixed or Floating Roof Tank 50 ft height	101.9	53.61	30.8	20.27	16.25	13.73	12.42	9.03	7.25
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	5467.8	2328	764.2	245.1	125.8	78.56	56.23	28.75	18.49
VCU or VO 40 ft height	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.84	1.5
VCU or VO 50 ft height	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.27
VCU or VO 60 ft height	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.03
Flare 30 ft height	9.31	9.31	9.31	9.31	9.31	9.25	8.02	5.55	4.37
Flare 40 ft height	5.55	5.55	5.55	5.55	5.55	5.55	5.55	4.27	3.6
Flare 50 ft height	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.41	2.81
Emergency Engine 8 ft height	188	188	185.2	87.73	52.81	36.51	28.58	15.6	11.02
Emergency Engine 12 ft height	95.89	95.89	95.89	73.6	45.55	33.22	26.8	15.12	10.61
Truck Loading	758.7	758.7	512.3	196.7	106.6	68.2	50.09	26.31	16.87
Railcar Loading	408.6	408.6	408.6	179	99.78	64.79	47.98	25.48	16.4
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	5357.3	2384.9	772.5	246.1	126.1	78.67	56.29	28.77	18.49
Heater	29.7	29.7	29.7	29.45	19.05	13.82	10.12	5.63	4.07
Boiler	11.4	11.4	11.4	11.4	11.4	9.98	8.38	5.14	3.99
Temporary Control Device (excluding temporary CAS) 12 ft height	44.16	44.16	44.16	31.91	20.53	14.32	10.3	5.96	4.47
Temporary Control Device (excluding temporary CAS) 20 ft height	19.32	19.32	19.32	19.32	14.9	11.87	9.26	5.3	4.05
Vacuum Trucks	629.3	488.5	337.1	158.6	90.83	60.33	45.27	24.48	15.87

Table 4e Region 14 Impacts Annual Averaging Time, X_i, (µg/m^3 per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	192.4	148	99.14	42.03	22.21	13.7	9.44	4.68	2.85
Fixed or Floating Roof Tank 30 ft height	52.9	29.68	20.31	15.21	11.43	8.58	6.6	3.8	2.48
Fixed or Floating Roof Tank 35 ft height	43.53	23.6	15.21	11.38	9.04	7.11	5.65	3.44	2.31
Fixed or Floating Roof Tank 40 ft height	36.79	19.52	11.99	8.78	7.2	5.88	4.81	3.07	2.12
Fixed or Floating Roof Tank 45 ft height	31.82	16.62	9.85	6.97	5.81	4.88	4.09	2.72	1.93
Fixed or Floating Roof Tank 50 ft height	27.97	14.45	8.32	5.69	4.77	4.07	3.48	2.4	1.75
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	1605	638	194.24	54.11	25.69	15.18	10.3	4.99	3
VCU or VO 40 ft height	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
VCU or VO 50 ft height	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
VCU or VO 60 ft height	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Flare 30 ft height	2.01	2.01	2.01	2.01	2.01	2.01	1.94	1.4	1.02
Flare 40 ft height	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.1	0.86
Flare 50 ft height	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.82	0.7
Emergency Engine 8 ft height	54.36	54.36	54.36	27.36	16.05	10.55	7.57	4.01	2.54
Emergency Engine 12 ft height	28.32	28.32	28.32	22.24	14.18	9.72	7.11	3.87	2.48
Truck Loading	225.8	225.8	144.5	48.96	24.18	14.51	9.88	4.82	2.91
Railcar Loading	119.3	119.3	119.3	46.2	23.45	14.21	9.71	4.76	2.88
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	1569.3	653.3	196.1	54.27	25.73	15.19	10.31	4.99	3
Heater	4	4	4	4	3.66	2.91	2.37	1.42	0.96
Boiler	2.11	2.11	2.11	2.11	2.11	2.07	1.93	1.34	0.96
Temporary Control Device (excluding temporary CAS) 12 ft height	4.85	4.85	4.85	4.76	4.03	3.11	2.49	1.47	0.99
Temporary Control Device (excluding temporary CAS) 20 ft height	2.61	2.61	2.61	2.61	2.61	2.38	2.07	1.34	0.93
Vacuum Trucks	192.4	148	99.14	42.03	22.21	13.7	9.44	4.68	2.85

Table 4f Region 14 Marine Loading Impacts at 25 Meters with 1-Hr and Annual Averaging Time, (µg/m^3 per lb/hr)

Emission Point	1-hr	Annual
Barge Loading Vent 10 ft	1630.8	138.4
Barge Loading Vent 15 ft	1116.1	53.37
Barge Loading Vent 20 ft	848.7	28.61
Ship Loading Vent 30 ft	418.6	10.12
Ship Loading Vent 40 ft	212.1	4.55
Ship Loading Vent 50 ft	143.8	2.53

Table 5a Region 15 Impacts 1-Hr Averaging Time, X_i, ($\mu g/m^3$ per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	3478.3	2302.2	1216.8	716.9	480.6	346.6	270.2	163.1	113.5
Fixed or Floating Roof Tank 30 ft height	710.3	604.8	440.2	252.9	167.1	141.8	125.3	90.59	74.25
Fixed or Floating Roof Tank 35 ft height	559.5	454.8	362	211	146.5	107.4	98.19	77.57	62.29
Fixed or Floating Roof Tank 40 ft height	462.5	355.1	298.9	182.7	129.3	96.32	76.42	63.98	54.37
Fixed or Floating Roof Tank 45 ft height	401.9	287.1	247.5	161.1	114.1	86.63	68.21	51.89	45.85
Fixed or Floating Roof Tank 50 ft height	360.3	238.9	206.3	141.3	99.99	78.58	62.72	41.88	37.62
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	20145.5	10845.1	4302.7	1614.3	911.4	607.4	449.2	254.8	172.6
VCU or VO 40 ft height	3.01	3.01	3.01	3.01	3.01	3.01	3.01	2.86	2.22
VCU or VO 50 ft height	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	1.85
VCU or VO 60 ft height	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.46
Flare 30 ft height	10.89	10.89	10.89	10.89	10.89	10.89	10.42	8.04	6.22
Flare 40 ft height	6.91	6.91	6.91	6.91	6.91	6.91	6.52	6.07	5.08
Flare 50 ft height	5.55	5.55	5.55	5.55	5.55	5.55	5.28	4.41	4.03
Emergency Engine 8 ft height	246.4	246.4	246.4	155.1	112.7	99.5	88.71	63.9	49.54
Emergency Engine 12 ft height	124.7	124.7	124.7	113	91.3	87.79	80.19	58.71	46.66
Truck Loading	6149	3728.1	2086.5	1047	633.7	435.9	329.6	190.9	130.5
Railcar Loading	4003.7	2912	1485.4	878.7	560	393	301.3	177.2	121.8
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	20673.3	11135.2	4368	1624.4	914.7	608.8	450	255.1	172.7
Heater	42.54	42.54	42.54	39.89	27.03	19.81	15.41	9.59	6.77
Boiler	13.55	13.55	13.55	13.55	13.55	12.73	11.2	8.01	6.1
Temporary Control Device (excluding temporary CAS) 12 ft height	61.89	61.89	61.89	44.67	28.83	20.63	16.11	10.01	7.08
Temporary Control Device (excluding temporary CAS) 20 ft height	23.98	23.98	23.98	23.98	19.89	15.77	12.84	8.43	6.2
Vacuum Trucks	3478.3	2302.2	1216.8	716.9	480.6	346.6	270.2	163.1	113.5

Table 5b Region 15 Impacts 3-Hr Averaging Time, X_i, (µg/m^3 per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	1856	1455.5	1078.6	667.9	443.9	318.6	242.4	143.8	100.5
Fixed or Floating Roof Tank 30 ft height	596.3	325.2	231.2	155.1	128.5	115.3	103.8	82.06	67.4
Fixed or Floating Roof Tank 35 ft height	507.9	268.4	177.3	121.9	94.15	85.21	78.79	64.08	55.34
Fixed or Floating Roof Tank 40 ft height	442.1	230.2	141.5	98.65	74.62	64.53	60.49	50.52	44.22
Fixed or Floating Roof Tank 45 ft height	392.4	202.2	116.8	81.55	61.93	50.36	46.92	40.06	36.22
Fixed or Floating Roof Tank 50 ft height	352.9	180.6	98.98	68.54	53	42.86	37.18	32.09	29.69
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	18563.2	9643	3851.6	1436.7	802.6	529.9	384	213.7	148.1
VCU or VO 40 ft height	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.51	2.12
VCU or VO 50 ft height	1.79	1.79	1.79	1.79	1.79	1.79	1.79	1.79	1.71
VCU or VO 60 ft height	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Flare 30 ft height	10.23	10.23	10.23	10.23	10.23	10.23	9.93	7.8	6.16
Flare 40 ft height	6.05	6.05	6.05	6.05	6.05	6.05	6.05	5.61	4.78
Flare 50 ft height	4.42	4.42	4.42	4.42	4.42	4.42	4.3	3.95	3.62
Emergency Engine 8 ft height	236.7	236.7	236.7	154	99.94	78.02	68.83	54.01	46.53
Emergency Engine 12 ft height	119.8	119.8	119.8	109.8	81.12	64.8	59.27	48.54	42.8
Truck Loading	2107.8	2107.8	1896.2	960	577.5	394	291.1	166.1	114.6
Railcar Loading	1336.4	1300.9	1300.9	813	514.5	358.6	267.9	155.1	107.4
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	17396.5	9899.7	3906.4	1444.7	805.2	531.1	384.6	213.9	148.2
Heater	40.91	40.91	40.91	39.28	26.57	19.51	15.27	9.44	6.66
Boiler	13.31	13.31	13.31	13.31	13.31	12.35	10.95	7.92	5.99
Temporary Control Device (excluding temporary CAS) 12 ft height	53.8	53.8	53.8	43.79	28.56	20.52	15.95	9.93	7.03
Temporary Control Device (excluding temporary CAS) 20 ft height	22.84	22.84	22.84	22.84	19.55	15.61	12.74	8.37	6.12
Vacuum Trucks	1856	1455.5	1078.6	667.9	443.9	318.6	242.4	143.8	100.5

Table 5c Region 15 Impacts 8-Hr Averaging Time, X_i, (µg/m^3 per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	1591.2	1191	918.6	542.6	347.6	243.3	181.2	103.3	68.29
Fixed or Floating Roof Tank 30 ft height	511	278.6	174.6	125.7	105.6	92.96	82.4	62.01	47.96
Fixed or Floating Roof Tank 35 ft height	433.5	230.3	136.8	93.73	77.2	67.84	61.54	49.26	40.04
Fixed or Floating Roof Tank 40 ft height	376.1	196.5	112.4	73.56	59.6	51.58	46.38	38.53	32.59
Fixed or Floating Roof Tank 45 ft height	332.6	171.9	95.66	60.18	47.85	40.99	36.47	30.15	26.18
Fixed or Floating Roof Tank 50 ft height	298.1	152.9	83.39	50.78	39.67	33.61	29.69	23.99	21.01
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	15741.7	7846.6	2985.5	1044	563	364.7	260.1	141.1	93.61
VCU or VO 40 ft height	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	1.86
VCU or VO 50 ft height	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.46
VCU or VO 60 ft height	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Flare 30 ft height	9.94	9.94	9.94	9.94	9.94	9.94	9.69	7.44	5.88
Flare 40 ft height	5.82	5.82	5.82	5.82	5.82	5.82	5.82	5.44	4.55
Flare 50 ft height	3.78	3.78	3.78	3.78	3.78	3.78	3.78	3.78	3.51
Emergency Engine 8 ft height	223.2	223.2	223.2	141.6	96.89	73.53	62.88	44.05	37.28
Emergency Engine 12 ft height	110.6	110.6	110.6	103.8	76.67	60.45	54.72	38.97	34.24
Truck Loading	1665.6	1665.6	1567.8	755.5	437.2	290.6	209.9	115	75.67
Railcar Loading	1090	1090	1090	650.9	396.6	269.5	197	109.6	71.59
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	14452.7	8053.4	3028.5	1049.9	564.8	365.4	260.5	141.3	93.67
Heater	37.27	37.27	37.27	37.27	25.24	18.77	14.55	8.91	6.23
Boiler	12.49	12.49	12.49	12.49	12.49	11.79	10.59	7.5	5.61
Temporary Control Device (excluding temporary CAS) 12 ft height	44.04	44.04	44.04	42.17	27.36	20.01	15.3	9.32	6.58
Temporary Control Device (excluding temporary CAS) 20 ft height	20.29	20.29	20.29	20.29	18.48	15	12.34	8.05	5.76
Vacuum Trucks	1591.2	1191	918.6	542.6	347.6	243.3	181.2	103.3	68.29

Table 5d Region 15 Impacts 24-Hr Averaging Time, X_i, (µg/m^3 per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	778.2	579.9	435.8	248.7	157.3	109.6	81.44	46.5	30.89
Fixed or Floating Roof Tank 30 ft height	246.7	135.4	85.59	62.25	50.08	42.44	36.78	26.88	20.53
Fixed or Floating Roof Tank 35 ft height	208.8	111.6	66.93	46.75	38.41	32.17	28.73	21.62	17.26
Fixed or Floating Roof Tank 40 ft height	180.7	94.89	54.83	36.56	30.22	25.68	23.33	17.25	14.24
Fixed or Floating Roof Tank 45 ft height	159.5	82.78	46.52	29.63	24.41	20.89	19.18	14.39	11.67
Fixed or Floating Roof Tank 50 ft height	142.7	73.45	40.43	24.96	20.2	17.33	16.02	12.17	10
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	7435.1	3692.3	1392.5	486.8	261.2	168.4	119.8	64.69	41.81
VCU or VO 40 ft height	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.2
VCU or VO 50 ft height	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
VCU or VO 60 ft height	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Flare 30 ft height	8.35	8.35	8.35	8.35	8.35	8.35	7.69	5.58	4.6
Flare 40 ft height	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.29	3.6
Flare 50 ft height	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.08	2.75
Emergency Engine 8 ft height	171.1	171.1	171.1	96.98	60.13	44.82	38.02	25.22	18.3
Emergency Engine 12 ft height	82.13	82.13	82.13	76.74	49.49	38.58	33.32	23.37	17.37
Truck Loading	728.9	728.9	728.9	345	198.6	132	95.44	52.64	34.4
Railcar Loading	510.8	510.8	510.8	297.2	179.6	121.7	88.96	49.69	32.66
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	6741.7	3789.1	1412.8	489.5	262	168.8	120	64.75	41.84
Heater	28.39	28.39	28.39	28.39	20.82	14.53	11.28	6.44	4.42
Boiler	10.18	10.18	10.18	10.18	10.18	9.95	8.3	5.66	4.2
Temporary Control Device (excluding temporary CAS) 12 ft height	32.65	32.65	32.65	32.65	22.04	15.24	11.77	6.67	4.89
Temporary Control Device (excluding temporary CAS) 20 ft height	15.34	15.34	15.34	15.34	15.34	12.21	9.46	5.96	4.28
Vacuum Trucks	778.2	579.9	435.8	248.7	157.3	109.6	81.44	46.5	30.89

Table 5e Region 15 Impacts Annual Averaging Time, X_i, (µg/m^3 per lb/hr)

Emission Point	Distance in feet								
	25	50	100	200	300	400	500	750	1000
Fixed or Floating Roof Tank 12 ft height	202.6	149.9	108.2	51.78	28.82	18.27	13.06	6.63	4.06
Fixed or Floating Roof Tank 30 ft height	58.63	32.05	20.83	15.49	12.13	9.5	7.71	4.75	3.21
Fixed or Floating Roof Tank 35 ft height	48.31	25.72	15.82	11.49	9.33	7.59	6.33	4.1	2.87
Fixed or Floating Roof Tank 40 ft height	40.85	21.37	12.62	8.87	7.32	6.13	5.2	3.52	2.54
Fixed or Floating Roof Tank 45 ft height	35.32	18.26	10.46	7.08	5.88	5.01	4.31	3.02	2.23
Fixed or Floating Roof Tank 50 ft height	31.02	15.91	8.9	5.82	4.82	4.16	3.61	2.59	1.95
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	1776.2	787.6	253.7	72.91	35.09	21.05	14.5	7.05	4.24
VCU or VO 40 ft height	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.12
VCU or VO 50 ft height	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
VCU or VO 60 ft height	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Flare 30 ft height	1.62	1.62	1.62	1.62	1.62	1.62	1.59	1.26	0.96
Flare 40 ft height	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.94	0.78
Flare 50 ft height	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.62
Emergency Engine 8 ft height	44.76	44.76	44.76	27.86	17.01	11.52	8.67	4.92	3.23
Emergency Engine 12 ft height	21.5	21.5	21.5	21.14	14.5	10.28	7.85	4.61	3.08
Truck Loading	190.6	190.6	168.2	63.81	32.56	19.85	13.93	6.88	4.17
Railcar Loading	128.5	128.5	128.5	58.65	31.13	19.27	13.61	6.79	4.13
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	1628.2	808.6	256.9	73.22	35.17	21.08	14.52	7.05	4.25
Heater	2.9	2.9	2.9	2.9	2.89	2.51	2.12	1.35	0.94
Boiler	1.64	1.64	1.64	1.64	1.64	1.64	1.61	1.22	0.92
Temporary Control Device (excluding temporary CAS) 12 ft height	3.28	3.28	3.28	3.26	3.23	2.71	2.24	1.4	0.98
Temporary Control Device (excluding temporary CAS) 20 ft height	1.96	1.96	1.96	1.96	1.96	1.91	1.76	1.22	0.89
Vacuum Trucks	202.6	149.9	108.2	51.78	28.82	18.27	13.06	6.63	4.06

Table 5f Region 15 Marine Loading Impacts at 25 Meters with 1-Hr and Annual Averaging Time, (µg/m^3 per lb/hr)

Emission Point	1-hr	Annual
Barge Loading Vent 10 ft	1836.8	136.8
Barge Loading Vent 15 ft	1212.1	53.62
Barge Loading Vent 20 ft	872.2	25.97
Ship Loading Vent 30 ft	476.9	8.9
Ship Loading Vent 40 ft	252.8	3.99
Ship Loading Vent 50 ft	159.1	2.17

Table 6 Minimum Discharge Parameters

Emission Point	Discharge Height (ft)	Exit Temperature (°F)	Exit Velocity (ft/sec)	Exit Diameter (ft)
Fixed or Floating Roof Tank	12	N/A	N/A	N/A
Fuel Storage Tank, Pressurized Tank MSS, ISO Container MSS, or CAS (Permanent or Temporary)	3	N/A	N/A	N/A
VCU or VO	40	1200	32	7
Flare	30	N/A	N/A	N/A
Emergency Engine	8	600	90	0.3
Truck Loading	8	N/A	N/A	N/A
Railcar Loading	10	N/A	N/A	N/A
Fugitive Emissions, Non-Tank MSS, Drum Loading, Non-ISO Container Loading, or Tote Loading	3	N/A	N/A	N/A
Heater	20	350	17	4
Boiler	30	330	24	2.8
Temporary Control Device (excluding temporary CAS)	12	1400	32	2
Vacuum Trucks	12	N/A	N/A	N/A
Barge Loading Vent	10	N/A	N/A	N/A
Ship Loading Vent	30	N/A	N/A	N/A