6.0 Regulatory Assessment

Under this task, facility-level emission estimates developed under Task 3 (point source testing) for well pads, compressor stations, and natural gas processing and treatment plants were evaluated against various federal and state air quality regulatory thresholds and standards applicable to these types of facilities. Regulatory standards considered include EPA's operating and construction permit rules, National Emissions Standard for Hazardous Air Pollutants (NESHAPs), and New Source Performance Standards (NSPS); TCEQ's permit-by-rule, standard permit, and other regulations applicable to upstream oil and gas facilities; and the city of Fort Worth's Gas Well Drilling Ordinance.

This section has four sub-sections:

- 6.1 Federal Air Quality Rules – A description of potentially applicable U.S. EPA air quality rules are provided here.
- 6.2 Texas Commission on Environmental Quality Air Quality Rules – This section provides a discussion of potentially applicable TCEQ air quality rules.
- 6.3 City of Fort Worth Air Quality Rules – The city of Fort Worth's Gas Well Drilling Ordinance (Ordinance No. 18449-02-2009) is discussed in this section.
- 6.4 Regulatory Assessment Conclusions – Provides a summary of the results of the regulatory assessment.

6.1 Federal Air Quality Rules

EPA regulates air emissions from stationary sources such as well pads and compressor stations through a variety of regulatory mechanisms. In brief, these are:

- Operating permit rules
- Construction permit rules
- NSPS
- NESHAPs
- The Greenhouse Gas Reporting Program

These air quality regulations are discussed individually in Sections 6.1.1 through 6.1.5.

6.1.1 Operating Permits

Operating permits are legally enforceable documents that permitting authorities issue to air pollution sources *after* the sources begin to operate. Depending on the magnitude of emissions from a facility, there are different types of operating permits available, with the largest sources (typically those emitting over 100 tons per year (tpy) of a regulated pollutant such as VOCs) required to obtain a Title V Operating permit. In Texas, these permits are issued by TCEQ as discussed below in Section 6.2.

6.1.2 Construction Permits

Construction permits are legally enforceable documents that permitting authorities issue to air pollution sources *before* construction. EPA regulations applicable to all new sources are included under the New Source Review (NSR) provisions, which are broken down into regulations for attainment areas and regulations for nonattainment areas. Tarrant County is considered a nonattainment area for ozone, which requires more stringent control of VOC and NO_x emissions.

The state of Texas implements the federal NSR rules through its construction permit program. Under Title 30 of the Texas Administrative Code (TAC), Chapter 116, Subchapter B, oil and gas exploration and production facilities may be authorized to construct through TCEQ's Permit-by-Rule (PBR), Standard Permit, or NSR permitting process. These types of permits are discussed in more detail below in Section 6.2.

6.1.3 New Source Performance Standards

NSPS regulations apply to new, modified, or reconstructed emission sources categorized by source type. For the oil and gas industry, the potentially applicable NSPS include the following:

- Subpart A—General Requirements (including flares)
- Subparts K and Ka—Storage Vessels for Petroleum Liquids
- Subpart Kb—Volatile Organic Liquid Storage Vessels (including Liquid Storage)
- Subpart GG—Stationary Gas Turbines
- Subpart KKK—Equipment Leaks of VOC from Onshore Natural Gas Processing Plants
- Subpart LLL—Onshore Natural Gas Processing: SO_2 Emissions
- Subpart IIII—Stationary Compression Ignition Internal Combustion Engines
- Subpart JJJJ—Stationary Spark Ignition Internal Combustion Engines
- Subpart KKKK—Stationary Combustion Engines

A brief discussion of each of these regulations follows. Where possible, a preliminary determination of compliance and applicability status with respect to the sites visited under the point source task has been made. However, a formal and comprehensive compliance and applicability assessment is not possible for each facility without a complete record of construction, monitoring, and recordkeeping activities.

Subparts K and Ka—Storage Vessels for Petroleum Liquids. These regulations apply to storage vessels for volatile organic liquids (including petroleum) built or modified after June 11, 1973 (Subpart K), or after May 18, 1978 (Subpart Ka). These rules apply to storage tanks with a design capacity greater than 40,000 gallons. None of the tanks visited under Task 3 have

capacities greater than 40,000 gallons, so it appears that none of the visited tanks are subject to these rules.

Subpart Kb—Volatile Organic Liquid Storage Vessels (Including Liquid Storage). This regulation applies to storage vessels for volatile organic liquids (including petroleum) built or modified after July 23, 1984 (Subpart Kb) and with a capacity greater than 19,800 gallons. Six tanks that were visited under Task 3 appear to have capacities greater than 19,800 gallons. However, the rule does not apply to "Vessels with a design capacity less than or equal to 1,589.874 m^3 (~420,000 gallons) used for petroleum or condensate stored, processed, or treated prior to custody transfer." Therefore, this rule does not appear to apply to any storage tanks visited under Task 3.

Subpart GG—Stationary Gas Turbines. This regulation applies to stationary gas turbines with a heat input at peak load greater than 10 million British thermal units (Btu) per hour. This rule limits NO_x and SO_2 emissions from subject facilities. ERG did not identify any gas turbines under Task 3.

Subpart KKK—Equipment Leaks of VOC from Onshore Natural Gas Processing Plants. This regulation applies to onshore natural gas processing plants as defined as "any processing site engaged in the extraction of natural gas liquids from field gas, fractionation of mixed natural gas liquids to natural gas products, or both." This rule requires VOC leak detection and repair at facilities that remove natural gas liquids from field gas. Site PS-159 (the Crosstex Amine Treatment Center) could be subject to this rule. However, status of compliance with the monitoring requirements under this rule cannot be determined using the data obtained at the time of the survey.

Subpart LLL—Onshore Natural Gas Processing: SO_2 Emissions. This regulation applies to sweetening units (process devices that remove hydrogen sulfide (H_2S) and CO_2 contents from sour natural gas) and sulfur recovery units at facilities that process natural gas. Sour natural gas is natural gas with an H_2S concentration greater than 0.25 grains per 100 standard cubic feet. The natural gas in the Barnett Shale is not considered to be sour natural gas, so this rule does not appear to apply to any facilities in Fort Worth.

Subpart IIII—Stationary Compression Ignition Internal Combustion Engines. This regulation applies to compression ignition internal combustion engines of various sizes, dependent upon date of construction. Much of this regulation is applicable to engine manufacturers themselves, not the engine users. This rule limits combustion emissions (hydrocarbons, NO_x, CO, and PM) from subject engines, which were not tested as part of this project. While this rule may apply to engines used at natural gas well pads and compressor stations in Fort Worth, no applicability or compliance determination can be made at this time.

Subpart JJJJ—Stationary Spark Ignition Internal Combustion Engines. This regulation, similar to Subpart IIII, applies to stationary spark ignition internal combustion engines of various sizes, dependent upon date of construction. Much of this regulation is applicable to engine manufacturers themselves, not the engine users. This rule limits combustion emissions (VOC, NO_x, and CO) from subject engines, which were not tested as part of this project. While this rule

may apply to engines used at natural gas well pads and compressor stations in Fort Worth, no applicability or compliance determination can be made at this time.

Subpart KKKK—Stationary Combustion Turbines. This regulation applies to stationary combustion turbines constructed, modified, or reconstructed after February 18, 2005. This rule limits NO_x and SO_2 emissions from subject facilities. ERG did not identify any gas turbines under Task 3.

6.1.4 National Emission Standards for Hazardous Air Pollutants

NESHAPs regulate HAPs from new and existing stationary sources. For the oil and gas industry, the potentially applicable NESHAPs include the following:

- Subpart H—Organic Hazardous Air Pollutants for Equipment Leaks
- Subpart V—Equipment Leaks (Fugitive Emission Sources)
- Subpart HH—Oil and Natural Gas Production Facilities
- Subpart VV—Oil-Water Separators and Organic-Water Separators
- Subpart HHH—Natural Gas Transmission and Storage Facilities
- Subpart YYYY—Stationary Combustion Turbines
- Subpart ZZZZ—Stationary Reciprocating Internal Combustion Engines

A brief discussion of each of these rules follows. Where possible, a preliminary determination of compliance and applicability status with respect to the sites visited under the point source task has been made. However, a formal and comprehensive compliance and applicability assessment is not possible for each facility without a complete record of construction, monitoring, and recordkeeping activities.

Many of the NESHAP regulations apply only to major HAP sources, those defined as emitting greater than 10 tpy of any single HAP, or 25 tpy of all HAPs combined. As a result of the point source testing task, three potential major HAP sources were identified, including two compressor stations (Site IDs PS-118 and PS-119) and the gas processing plant (Site ID PS-159). All of these facilities were determined to be major HAP sources due to formaldehyde emissions from their compressor engines. Due to the conservative nature of the emissions estimation approach used for these engines (24-hour-per-day, 365-day-per-year operation of all the engines at the facility without controls), a full compliance evaluation would need to be made to definitively conclude whether or not these facilities are major sources of HAP.

Subpart H—Organic Hazardous Air Pollutants for Equipment Leaks. This regulation applies to sources subject to other NESHAP rules under 40 CFR Part 63 that specifically point back to this rule. As such, any applicability under Subpart H would be referenced in the rules discussed below.

Subpart V—Equipment Leaks (Fugitive Emission Sources). This regulation applies to pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or

lines, valves, connectors, surge control vessels, bottoms receivers, and control devices or systems that are intended to operate in volatile HAP service. However, this rule is only triggered when the fluid or gas flowing through the equipment contains at least 10% by weight of a volatile HAP. No sources visited under Task 3 have volatile HAP concentrations of 10% or greater.

Subpart HH—Oil and Natural Gas Production Facilities. This regulation applies to oil and gas production facilities. There are different requirements for major and minor HAP sources, based on the magnitude of emissions. Requirements for major HAP sources include controlling HAP from tanks with flash emissions, controlling equipment leaks, and controlling glycol dehydrators. As discussed above, there are three potential major HAP sources that were visited that may be subject to the major source provisions of this regulation.

For minor HAP sources, there are limited requirements under this rule for triethylene glycol dehydration units, and those requirements are dependent upon the throughput or benzene emissions. For sources with benzene emissions less than 1 tpy, the only requirement is to maintain records verifying the benzene emission rate. There was one source visited under Task 3 that was estimated to emit over one tpy of benzene, the gas processing plant (PS-159). The remainder of the sites emitted less than one tpy of benzene. The only requirement applicable to these sources would be to keep records (as defined under the rule) of benzene emissions.

Subpart VV—Oil-Water Separators and Organic-Water Separators. This regulation applies to facilities that control air emissions from oil-water and organic-water separators. However, it only applies when another NESHAP subpart references it. No such facilities have been identified under this project.

Subpart HHH—Natural Gas Transmission and Storage Facilities. This regulation applies to owners and operators of natural gas transmission and storage facilities that transport or store natural gas before it enters the pipeline to a local distribution company or a final end user, and that are major sources of HAPs. A compressor station that transports natural gas prior to the point of custody transfer or to a natural gas processing plant (if present) is not considered a part of the natural gas transmission and storage source category. If applicable, this rule would require control of emissions from any glycol dehydration unit that emits more than 1 tpy of benzene. As mentioned above, the gas processing plant (PS-159) was the only facility estimated to emit over one tpy of benzene, with estimated benzene emissions at 1.2 tpy.

Subpart YYYY—Stationary Combustion Turbines. This regulation applies to stationary combustion turbines located at major sources of HAPs. ERG did not identify any stationary combustion turbines under Task 3.

Subpart ZZZZ—Stationary Reciprocating Internal Combustion Engines. This regulation applies to stationary reciprocating internal combustion engines located at major and area sources of HAPs. The applicability of this rule depends on both the construction date and the size of the engine. For many of the engines subject to this rule in Fort Worth, the only requirements are to comply with 40 CFR part 60 subpart IIII for compression ignition engines, or 40 CFR part 60 subpart JJJJ for spark ignition engines, as discussed in Section 6.1.3. Certain engines may also be required to specifically control formaldehyde emissions.

6.1.5 Greenhouse Gas Reporting Program

On November 8, 2010, EPA signed a rule that finalizes reporting requirements for the petroleum and natural gas industry under 40 CFR Part 98, the regulatory framework for the Greenhouse Gas Reporting Program. In short, Subpart W of Part 98 requires petroleum and natural gas facilities that emit 25,000 metric tons or more of CO_2 equivalent per year to report annual methane and CO_2 emissions from equipment leaks and venting, and emissions of CO_2, methane, and nitrous oxide from gas flaring and from onshore petroleum and natural gas production stationary and portable combustion emissions and combustion emissions from stationary equipment involved in natural gas distribution. However, this rule does not require facilities to report their emissions until March 31, 2012, at which time emissions for the 2011 calendar year will need to be reported for subject facilities.

Based on the results of the point source testing, there are several facilities with methane emissions from equipment leaks and venting that emit over 8,000 metric tons of CO_2 equivalents per year. In addition, emissions from compressor engine exhausts are likely to account for a significant amount of CO_2 (a single 2,000 hp engine may emit over 7,000 metric tons of CO_2 equivalents per year), which would result in many of the larger compressor stations exceeding the annual threshold of 25,000 metric tons of CO_2 equivalent emissions. As such, it appears that several facilities in the city of Fort Worth will be required to report their greenhouse gas emissions to EPA under this rule beginning in 2012.

However, it should be noted that there is some uncertainty as to the applicability of this rule, and EPA is currently actively providing guidance and rule interpretation to the oil and gas industry as they prepare to begin reporting emissions next year.

6.2 Texas Commission on Environmental Quality Air Quality Rules

Like EPA, TCEQ regulates air emissions from stationary sources related to upstream oil and gas facilities through a variety of regulatory mechanisms:

- PBRs
- Standard permits
- NSR permits
- Control of Air Pollution from Visible Emissions and Particulate Matter
- Control of Air Pollution from Sulfur Compounds
- Standards of Performance for Hazardous Air Pollutants and for Designated Facilities and Pollutants
- Control of Air Pollution from Volatile Organic Compounds
- Control of Air Pollution from Nitrogen Compounds
- Federal operating permits

These air quality regulations are discussed individually in Sections 6.2.1 through 6.2.9. Where possible, a preliminary determination of compliance and applicability status with respect

to the sites visited under the point source task has been made. However, a formal and comprehensive compliance and applicability assessment is not possible for each facility without a complete record of construction, monitoring, and recordkeeping activities.

6.2.1 Permit-by-Rules

> ***Key Point: Permit-By Rule***
> TCEQ's PBR for Oil and Gas Handling and Production Facilities is the primary regulatory mechanism applicable to natural gas well pads and compressor stations in Fort Worth.

PBRs are an abbreviated permitting mechanism provided by TCEQ to authorize emissions from new construction or modifications to existing facilities. PBR requirements are grouped by source types (e.g., stationary turbines and engines) and codified under Title 30 of the Texas Administrative Code (TAC), Chapter 106 (30 TAC 106). The most common PBR used to authorize new construction or modifications involving oil and gas exploration and production facilities is found under 30 TAC 106, Subchapter O, Section 106.352, "Oil and Gas Handling and Production Facilities." TCEQ updated this PBR in February 2011, significantly expanding the requirements for oil and gas handling and production facilities located in the Barnett Shale, including Tarrant County. Per the rule, these new requirements took effect in April 2011 and apply only to new or modified emissions sources.

The new requirements include more stringent control requirements and emission limits. In addition to more stringent site-wide emission limits, the revised PBR requires a health effects demonstration using calculated emission limits based on ESLs for certain toxins and source specific characteristics. The maximum emission rates allowed by the new PBR for Level 2 Requirements are summarized in Table 6.2-1.

Table 6.2-1. New PBR Emission Rates

Pollutant	Steady-state lb/hr	< 30 psig periodic lb/hr up to 300 hr/yr	≥ 30 psig periodic lb/hr up to 300 hr/yr	Total tpy
Total VOC				25
Total crude oil or condensate VOC	100	145	318	
Total natural gas VOC	356	750	1,500	
Benzene	3.35	7	15.4	4.8
Hydrogen sulfide	6	6	9.8	25
Sulfur dioxide	63	93.2		25
Nitrogen oxides	54.4			250
Carbon monoxide	57			250
$PM_{2.5}$	12.7			10
PM_{10}	12.7			15

The ESL based emission limits are site and source specific based on the source characteristics and the distance of the source relative to the nearest off-site receptor.

Based on the emission estimates developed under Task 3, most of the facilities surveyed would likely meet the new site-wide emissions limits if they were applicable, except for two compressor stations (Site IDs PS-118 and PS-127) and the gas processing facility (Site ID PS-159). The emissions estimates for CO from these three sites are above the CO lb/hr emission limits. A complete comparison to the new ESL based emission limits cannot be determined using the data collected during the point source testing.

As the new PBR rule was not in effect at the time of the point source testing, it is likely that most of the emissions sources located at the sites tested in Task 3 were previously authorized and were operating under the old PBR requirements outlined in 30 TAC Section 106.352(l). Under the old PBR requirements, total emissions could not exceed 25 tpy each of SO_2, all other sulfur compounds combined, or all VOCs combined or 250 tpy each of NO_x and CO. Total emissions of sulfur compounds, excluding sulfur oxides, from all vents could not exceed 4.0 pounds per hour. Through the point source testing task, three potential sources were identified, including two compressor stations (Site IDs PS-118 and PS-119) and the gas processing plant (Site ID PS-159), with site-wide emissions exceeding the 25 tpy VOC limit. Additionally, estimated CO emissions from two compressor stations (Site IDs PS-118 and PS-127) and the gas processing plant (Site ID PS-159) exceed the 250 tpy threshold. For each of these facilities, it appears that emissions from the natural gas compressor engines cause them to exceed PBR thresholds.

30 TAC Section 106.352(l) also requires compressors and flares to meet the requirements of §106.492 and §106.512 of 30 TAC (relating to flares and stationary engines and turbines, respectively). 30 TAC §106.512 limits NO_x emissions, depending on engine type (rich-burn or lean-burn), fuel type (gas-fired, dual fuel-fired, liquid fuel-fired) and manufacturing date.

Compliance with the emission specification requirements under the PBR rules cannot be determined using the data obtained at the time of the survey. Records of manufacturing dates and the dates in which existing sources were last modified would be required to complete a full compliance assessment for any individual facility.

6.2.2 Standard Permit

Similar to PBRs, standard permits are an abbreviated permitting mechanism provided by TCEQ to authorize emissions from new construction or modifications. However, standard permits generally require more stringent emission controls meeting what is considered the best available control technology (BACT). New construction or modifications involving oil and gas exploration and production facilities permitted by standard permit must meet the requirements provided under 30 TAC Chapter 116, Subchapter F, Section 116.620, “Installation and/or Modification of Oil and Gas Facilities.” The standard permit issued by TCEQ often includes site-specific requirements including, but not limited to, site-wide and/or source-specific emission limits. While some of the facilities visited in Task 3 may have been authorized under a standard permit, no information on these was available during this review.

6.2.3 New Source Review Permits

New construction or projects involving modifications to existing facilities that cannot meet the requirements of an applicable PBR or standard permit must be authorized prior to start of construction under 30 TAC Chapter 116, Subchapter B, "New Source Review Permits." This permitting mechanism requires installation of either BACT or lowest achievable emission reductions, depending on whether the source is located in an attainment or a non-attainment area. Tarrant County is located in a non-attainment area for ozone, so the latter would be required for project sources emitting VOCs and NO_x; BACT would be required for all other project-related criteria pollutants. NSR permits also require two public notice periods and a health impacts review to evaluate to potential health impacts from certain toxins associated with the project-related emissions. The NSR permit issued by TCEQ often includes site-specific requirements including, but not limited to, site-wide and/or source-specific emission limits. NSR permits issued for the sites visited under Task 3 were considered outside the scope of this study, and were therefore not reviewed.

6.2.4 Control of Air Pollution from Visible Emissions and Particulate Matter

This rule regulates the amount of visible emissions and particulate matter that are permissible from any source operated in Texas. Visible emissions from stationary vents are not allowed to exceed opacities greater than 30% averaged over a six-minute period, 20% averaged over a six-minute period for any source on which construction was begun after January 31, 1972, or 15% averaged over a six-minute period for any source having a total flowrate greater than or equal to 100,000 actual cubic feet per minute, unless an optical instrument capable of measuring the opacity of emissions is installed in the vent. No visible emissions were observed from stationary vents located at the sites visited under Task 3. Visible emissions from a process gas flare used in routine or scheduled facility operations are not allowed for more than five minutes in any two-hour period. Two sites visited during Task 3 operated flares; however, compliance status with the requirements under this rule cannot be determined using the data obtained at the time of the survey. Compliance status with this requirement cannot be determined for the vents visited using the data obtained at the time of the survey. However, considering the nature of material (i.e., natural gas) being managed at the sites studied, the particulate matter emission rate limits specified are not expected to be exceeded.

6.2.5 Control of Air Pollution from Sulfur Compounds

This rule regulates the amount of sulfur compound emissions, particularly SO_2, H_2S, sulfuric acid, and total reduced sulfur, that are permissible from certain sources operated in Texas. Those sulfur compounds applicable to the operation of oil and gas facilities are SO_2 and H_2S. SO_2 emissions from a source or sources operated on a property or multiple sources operated on contiguous properties cannot cause an exceedance of a net ground level concentration of 0.4 parts per million by volume (ppmv) averaged over any 30-minute period. H_2S from a source or sources operated on a property or multiple sources operated on contiguous properties are also limited; the specific limit depends on the affected downwind sources.

Compliance with the ground-level concentration requirements under this rule cannot be determined using the data obtained at the time of the survey. As mentioned previously, the natural gas in the Barnett Shale is not considered to be sour natural gas, so this rule does not appear to apply to any facilities in Fort Worth.

6.2.6 Standards of Performance for Hazardous Air Pollutants and for Designated Facilities and Pollutants

This rule simply incorporates, by reference, all of the federal NESHAPs that regulate HAPs from new and existing stationary sources. Section 6.1.4 lists and briefly describes the potentially applicable NESHAPs for the oil and gas industry.

6.2.7 Control of Air Pollution from Volatile Organic Compounds

This rule regulates the amount of VOCs that are permissible from sources operated in Texas. The rule requirements are organized by source type under 30 TAC Chapter 115 and only apply to sources located in non-attainment areas specified in the rule. Those parts of the rule that are potentially subject to upstream oil and gas facilities are Subchapter B, Division 1, "Storage of VOCs"; Subchapter C, Division 1, "Loading and Unloading of VOCs"; and Subchapter D, Division 3, "Fugitive Emission Control in Petroleum Refining, Natural Gas/Gasoline Processing, and Petrochemical Processes in Ozone Non-attainment Areas." Storage tanks containing VOCs including, but not limited to, crude or condensate must control emissions using control technologies specified in the rule. Control options vary depending on the size of the tank and its configuration. Loading of certain VOC materials must be controlled by a vapor control system that maintains a control efficiency of at least 90%, a vapor balance system, or pressurized loading. This rule also requires VOC leak detection and repair at natural gas/gasoline processing operations. Site PS-159 (the Crosstex Amine Treatment Center) could be subject to this rule.

Compliance status with the control and monitoring requirements under this rule cannot be determined using the data obtained at the time of the survey.

6.2.8 Control of Air Pollution from Nitrogen Compounds

This rule regulates the amount of nitrogen compounds that are permissible from sources operated in Texas. Similar to 30 TAC Chapter 115, the rule requirements for this chapter are organized by source type under 30 TAC Chapter 117 and only apply to sources located in non-attainment areas specified in the rule. Those parts of the rule that are most commonly subject to upstream oil and gas facilities are found under Subchapter D, "Combustion Control at Minor Sources in Ozone Non-attainment Areas." For the Dallas–Fort Worth area, including Tarrant County, NO_x emissions from stationary internal combustion engines at any minor stationary source of NO_x (a source that emits less than 250 tpy) are limited, depending on engine type and construction date. Most engines at sites visited under Task 3 would be subject to a limit of 0.50 grams of NO_x per hp per hour.

Compliance with the emission specification requirements under this rule cannot be determined using the data obtained at the time of the survey. Records of manufacturing dates and

the dates in which existing sources were last modified would be required to complete a full compliance assessment for any individual engine.

6.2.9 Federal Operating Permits

The Title V Federal Operating Permit Program is regulated under 30 TAC Chapter 122. Title V operating permits are required for any site that is a major source. A major source is a site which that emits, or has the potential to emit, 100 tpy or more of any air pollutant. A site is also considered a major source if it emits or has the potential to emit, in the aggregate, 10 tpy or more of any single hazardous air pollutant listed under the federal Clean Air Act or 25 tpy or more of any combination of hazardous air pollutants listed under the Act. One of the primary objectives of the Title V operating program is to assimilate in one document all of the requirements to which a facility is subject. The Title V permit serves as the key verification and documentation of a facility's compliance with all applicable requirements of the Texas and federal Clean Air Acts. Permit holders must annually certify compliance with the permit terms and conditions and submit semi-annual deviation reports in which they self-disclose known non-compliance activities during the reporting period.

Five potential major sources were identified, including three compressor stations (Site IDs PS-118, PS-119, PS-127), the gas processing plant (Site ID PS-159), and one well pad (Site ID 238). All of these facilities were determined to be major sources due to formaldehyde and/or CO emissions from their compressor engines. However, due to the conservative nature of the emissions estimation approach used for these engines (24-hour-per-day, 365-day-per-year operation of all the engines at the facility without controls), a full compliance evaluation would need to be made to definitively conclude whether or not these facilities are major sources and subject to the Title V Federal Operating Program.

6.3 City of Fort Worth Air Quality Rules

The city of Fort Worth's Gas Well Drilling Ordinance (Ordinance No. 18449-02-2009) has one provision that requires air emissions control. Under Section 15-42 of this ordinance, tank batteries with a rolling annual aggregate emissions rate of 25 tpy or more of VOC must use vapor recovery equipment with a 95% recovery efficiency. Based on the results of the point source testing under Task 3, two compressor stations (Site IDs PS-118 and PS-119) and the gas processing plant (Site ID PS-159) have facility-wide VOC emissions greater than 25 tpy. However, the majority of the VOC emissions at these sites come from non-tank emission points and the natural-gas-fired compression engines, and none of these facilities have VOC emissions from their storage tank batteries exceeding 25 tpy. Therefore, based on the results of Task 3, this rule does not appear to apply to any of the tested facilities.

6.4 Regulatory Assessment Conclusions

A regulatory assessment was conducted based on the results of the point source testing to determine if any facilities exceeded regulatory thresholds. For many of the rules potentially applicable to oil and gas sources in Fort Worth, we were unable to make a definitive determination on whether the source was subject to the rule, and/or whether the source was in

compliance with the rule. A full compliance evaluation for any individual site is an involved process that requires research into historical construction, operating, and production records and was beyond the scope of this study. However, based on the emission estimates developed under Task 3, the sources listed in Table 6.4-1 may exceed the regulatory thresholds discussed above.

Table 6.4-1. Sources Above Regulatory Thresholds

Site ID	Site Type	VOC (tons/yr)	CO (tons/yr)	Total HAP (tons/yr)	Formaldehyde (tons/yr)
PS-159	Processing Facility	80[a]	1,039[b, c]	47[d]	32[e]
PS-118	Compressor Station	43[a]	270[b, c]	25[d]	17[e]
PS-119	Compressor Station	38[a]	240[c]	22	15[e]
PS-127	Compressor Station	24	545[b, c]	14	9
238	Well Pad	14	219[c]	8	6

[a] This site potentially exceeds the 25 tpy VOC threshold under 30 TAC 106, Subchapter O, Section 106.352.

[b] This site potentially exceeds the 250 tpy CO threshold under 30 TAC 106, Subchapter O, Section 106.352.

[c] This site potentially exceeds the 100 tpy CO threshold under the federal Title V Operating Permit Program.

[d] This site potentially exceeds the 25 tpy total HAP threshold under the federal Title V Operating Permit Program.

[e] This site potentially exceeds the 10 tpy single HAP threshold under the federal Title V Operating Permit Program.