December 4, 2019 Reference No. 11203434

Mark Jones
New Mexico Environment Department
Air Quality Bureau
525 Camino de los Marquez, Suite 1
Santa Fe, New Mexico 87505

Dear Mr. Jones:

**Re: Four Factor Analysis – Supplemental Sections**
**Jal No. 3 Gas Plant**
**ETC Texas Pipeline, Ltd.**

GHD Services, Inc. (GHD) is submitting, on behalf of ETC Texas Pipeline, Ltd., supplemental sections of the Four-Factor Analysis for the Jal No. 3 Gas Plant to the New Mexico Environment Department (NMED). These supplemental sections were prepared in response to the November 14, 2019 NMED letter concerning Process Flaring and Startup, Shutdown, and Maintenance (SSM) Flaring for regional haze planning in New Mexico.

GHD previously submitted a Four-Factor Analysis report to NMED dated October 28, 2019. The enclosed supplemental sections (Sections 1 and 3) address SSM Flaring and replace the previously submitted sections. The remaining sections (Sections 2 and 4) remain unchanged.

If you have questions or comments, please contact me at 720-974-0937 or Carolyn Blackaller at 817-302-9766.

Sincerely,

GHD

Sergio Guerra
Project Manager

sg/aw/2

Encl. Four-Factor Analysis – Supplemental Sections

cc: Carolyn Blackaller – Energy Transfer

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# 1. Executive Summary

In response to the New Mexico Environment Department (NMED) letter dated July 18, 2019, GHD Services, Inc. (GHD) was retained by ETC Texas Pipeline, LTD to prepare a four-factor analysis for the NMED Regional Haze Second Planning Period Progress Analysis under the Clean Air Act (CAA) and Regional Haze Rule (40 CFR §51.300 to 51.309). As a part of this Progress Analysis, $NO_x$ and $SO_2$ emissions were evaluated at the Jal No.3 Gas Plant (Jal 3 GP), which is a natural gas treating and processing plant.

The four-factor analysis is codified in 40 CFR §51.308(d)(1)(i)(A) and is designated as a means for establishing reasonable progress goals towards achieving natural visibility conditions. The four factors to consider are:

1. The costs of compliance
2. The time necessary for compliance
3. The energy and non-air quality environmental impacts of compliance
4. The remaining useful life of any potentially affected sources

The purpose of the four-factor analysis is to identify control measures for reducing emissions that could be used to establish the long-term strategy for attaining the states visibility goals. The NMED has requested that evaluations be completed for individual equipment that have a potential to emit (PTE) greater than ten pounds per hour of $NO_x$ or $SO_2$. The source categories identified at the Jal 3 GP for evaluation are two existing RICE compressor engines (4A and 5A), a thermal oxidizer (9S), and two SSM flares (9F and 10F). Based on correspondence and guidance from NMED, actual emissions from reporting year 2016 should be used as baseline emissions to calculate emission reductions for control options evaluated. The cost range for emission reductions reflects the range of operation time in 2016 between the two RICE compressor engines analyzed. The results of the subsequent four-factor analysis are summarized in Table 1.1 below:

Table 1.1 Summary of Jal 3 GP Four Factor Analysis Results

| Source Category | Regional Haze Pollutant Analyzed and Control Option | Average Cost in 2019 Dollars (dollars per ton of pollutant reduction) | Compliance Timeframe | Energy & Non-Air Quality Impacts | Remaining Useful Life |
|---|---|---|---|---|---|
| RICE Engines | $NO_x$ ; Low Emission Controls (LEC) | $6,300-$23,900/ton | 2-5 years | None known for LEC | 25 years for controls; Indefinite for RICE engines |
| RICE Engines | $NO_x$ ; Selective Catalyst Reduction (SCR) | $7,500-$28,600/ton | 2-5 years | Generation of hazardous materials for SCR | 25 years for controls; Indefinite for RICE engines |
| Thermal Oxidizer | $SO_2$ | N/A | N/A | N/A | Indefinite |
| SSM Flares | $NO_x$/$SO_2$ | N/A | N/A | N/A | Indefinite |

# 3. Source Category Analysis for Flares and Thermal Oxidizer

## 3.1 Source Category Description

The facility is permitted for a total of three (3) flares and one (1) thermal oxidizer. Two (2) of the flares, units 9F and 10F, are also permitted for startup, shutdown, and maintenance (SSM) flaring. A summary of the equipment is in Table 3.1 below:

Table 3.1 Summary of Jal 3 GP Flares and Thermal Oxidizer Units

| Unit No. | Make/Model | Permitted Capacity | $NO_x$ PTE per unit (lb/hr) | $SO_2$ PTE per unit (lb/hr) |
|---|---|---|---|---|
| 9S | Entec Thermal Oxidizer | 8 MMBtu/hr | 3.500 | 275.3 |
| 8F | John Zink Gas Plant Flare | 10 MMcfd | 0.050 | 0.0075 |
| 9F | John Zink Treatment Flare | 2.9 MMcfd | 0.250 | 0.029 |
| 10F | John Zink Inlet Flare | 75 MMcfd | 0.080 | 0.011 |
| Flare 9F SSM | John Zink Treatment Flare | 2.9 MMcfd | 2.010 | 3820.9 |
| Flare 10F SSM | John Zink Inlet Flare | 75 MMcfd | 430.1 | 2773.2 |
| SSM-Inlet (Flare 10F) | John Zink Inlet Flare (Routine Inlet Blowdowns) | 75 MMcfd | 0.660 | 2.90 |

Per Table 3.1 above, the $SO_2$ emissions from the thermal oxidizer (Unit 9S) and SSM flaring (Units 9F and 10F) exceed the 10 lb/hr threshold requested by the NMED. $NO_x$ emissions from SSM flaring (Unit 10F) also exceed the 10 lb/hr threshold.

The facility is a natural gas treating and processing plant. The high pressure inlet natural gas stream is controlled by the Inlet Flare (Unit 10F). Natural gas is treated in amine sweetening units to remove acid gas, consisting of approximately 70% $CO_2$ and 18% $H_2S$, with traces of other gases. The sweetened natural gas stream is controlled by the Treatment Flare (9F). Acid gas removed from the natural gas stream by the sweetening units is directed to either the sulfur recovery unit (SRU) where the bulk of the $H_2S$ is converted to elemental sulfur, which is then disposed-of; or sent to a Class II underground injection disposal well, permitted by the Oil Conservation Division (OCD). The remaining acid gas from the SRU, consisting of $CO_2$ and the remaining $H_2S$ in the gas stream, are vented to a thermal oxidizer (Unit 9S), where the $H_2S$ is combusted to form $SO_2$. Throughput through the amine units is limited to 50 long tons of sulfur a day, pursuant to 20.2.35.110.A NMAC and 20.2.35.110.B NMAC, as appropriate. The thermal oxidizer (Unit 9S) combusting $H_2S$ to form $SO_2$ has a potential-to-emit permit limit of 275.3 lb/hr for $SO_2$, which exceeds the 10 lb/hr threshold for New Mexico's state implementation of CAA Regional Haze Planning, and is therefore being assessed for the four factor analysis. SSM flaring emissions from the Treatment Flare (9F) and Inlet Flare (10F) are also being assessed.

## 3.2 Clean Air Act and State Regulations

The thermal oxidizer controlling $H_2S$ emissions at the facility (Unit 9S) and SSM flares (Units 9F and 10F) controlling emergency releases and other  are subject to the following state and federal regulations:

### *20.2.35 NMAC Natural Gas Processing Plant - Sulfur*

All units at the facility, including units 9S, 9F, and 10F, are subject to this state regulation for sulfur emissions at natural gas processing plants.

### *20.2.37 NMAC Petroleum Processing Facilities*

All units at the facility, including units 9S, 9F, and 10F, are subject to this state regulation for "new processing facilities" for which a modification commenced on or after July 1, 1974. Sections 200 (mercaptan and hydrogen sulfide emissions), 202 A. (Petroleum processing facility), 203 (ammonia emissions) and 205 (storage, handling, pumping, and blow down) apply to Jal 3 GP.

### *20.2.77 NMAC New Source Performance*

Unit 9S, 9F, and 10F are subject to the requirements of 40 CFR Part 60, as amended through January 31, 2009.

### *NSPS 40 CFR 60, Subpart LLL Standards for $SO_2$ Emissions*

The facility is a natural gas processing plant, including a sweetening unit followed by a sulfur recovery unit and thermal oxidizer (Unit 9S), constructed after January 20, 1984, and meets the applicability criteria of 40 CFR 60.640. This regulation applies to the sweetening unit with or without the SRU and thermal oxidizer. As given in 40 CFR 60.640(e), this regulation does not apply to amine unit when it sends acid gas to acid gas re-injection well (AGI).

## 3.3 $NO_x$ and $SO_2$ Emissions from Flares and Thermal Oxidizer

### 3.3.1 $NO_x$ and $SO_2$ Emissions and Control Options

$NO_x$ emissions are generated from the combustion of natural gas and $SO_2$ emissions are generated from the combustion of $H_2S$.

The facility operates two amine units to remove $H_2S$ from the natural gas stream. From the amine units, the remaining acid gas is sent to a sulfur recovery unit (SRU) which scrubs $H_2S$ from the gas at a 92% efficiency with the leftover $H_2S$ combusted by thermal oxidizer (TO) to form $SO_2$. During SRU/TO downtime, the $H_2S$ is injected to acid gas injection (AGI) wells.

These existing controls are the best known technologies for controlling acid gas and, to our knowledge, there are no other technically feasible control options available to further reduce $SO_2$ emissions from the thermal oxidizer (Unit 9S).

The Treatment Flare (9F) and Inlet Flare (10F) control emergency pressure releases and other SSM emission events at the facility. Scrubbing is a recent emergent technology on the market for controlling both volatile organic carbon (VOC) emissions and $H_2S$ emissions, however these

systems are applied to flare gases with very high $H_2S$ (5-20% ranges) and $H_2S$ in the inlet gas at the Jal 3 GP is just 0.59%. Additionally, there are already existing inlet scrubbers in place at the facility.

For SSM $NO_x$ emissions from the Inlet Flare (Unit 10F), the actual baseline emissions reported in the 2016 emission inventory accounted for just 7.5% of all $NO_x$ emissions at the facility. Additionally, vendors are not able to provide viable solutions for $NO_x$ mitigation due to difficulty obtaining significant reductions beyond what is already being achieved at the facility.

For these reasons, there are no technically feasible control options available to further reduce SSM $NO_x$ and $SO_2$ emissions from the Treatment Flare (9F) and Inlet Flare (10F).