

March 15, 2023

New Mexico Environmental Department  
Air Quality Bureau  
Permits Section  
525 Camino de los Marquez, Suite 1  
Santa Fe, New Mexico 87505

RE: Title V P288 Permit Revision  
Targa Northern Delaware LLC; Frac Cat Compressor Station

Permit Program Manager:

Targa Northern Delaware LLC is submitting a Title V Revision for the Frac Cat Compressor Station, currently authorized under Title V Permit No. P288. With this submission, Targa seeks to update the permit conditions for Startup, Shutdown, & Maintenance and Malfunction activities. This is in response to EPA's November 16, 2022, Order Granting in Part and Denying in Part Petitions for Objection to Permit for the Frac Cat Compressor Station, Permit P288. Attached you will find the following revised pages of the Universal Air Quality Permit Application for the Title V permit:

- Section 6: All Calculations
- Section 7: Information Used to Determine Emissions and
- Section 22: Certification

Please feel free to contact me at 713-584-1292 or by email at [twallace@targaresources.com](mailto:twallace@targaresources.com) if you have any questions regarding this submission.

Sincerely,

Targa Northern Delaware LLC

*Tammy H. Wallace*

Tammy H. Wallace  
Senior Environmental Specialist

Cc: Charles Bates (Targa Northern Delaware LLC)  
Jason Fuentes (Targa Northern Delaware LLC)  
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**Air Quality Bureau TV Permit No. P288**

**A107 Facility: Allowable Startup, Shutdown, & Maintenance (SSM) and Malfunction Emissions]**

- A. The maximum allowable SSM and Malfunction emission limits for this facility are listed in Table 107.A and were relied upon by the Department to determine compliance with applicable regulations.

**Table 107.A: Allowable SSM and Malfunction Units, Activities, and Emission Limits**

| Unit No. | Description  | VOC (tpy) |
|----------|--|-----------|
| SSM/M    | <sup>1</sup> Venting of Gas Due to SSM and Malfunction | 10.0      |

1. This authorization does not include VOC combustion emissions.
2. To report excess emissions for sources with no pound per hour and/or ton per year emission limits, see condition B110.E.

- B. The authorization of emission limits for startup, shutdown, maintenance, and malfunction does not supersede the requirements to minimize emissions according to Conditions B101.C and B107.A.

- C. Combined SSM and Malfunction Emissions (VOCs)

**Requirement:**

**(1) Compliance Method**

The permittee shall perform a facility inlet and residue gas analysis once every calendar year.

On a monthly basis, the permittee shall complete the following monitoring and recordkeeping to demonstrate compliance with the allowable venting emission limits in Table 107.A for routine or predictable startup, shutdown, and maintenance (SSM); and/or malfunctions (M) herein referred to as SSM/M.

**(2) Emissions included in Permit Limit and/or Reported as Excess Emissions**

- (a) All emissions due to routine or predictable startup, shutdown, and/or maintenance (SSM) must be included under and shall not exceed the 10 tpy SSM/M emission limit in this permit. For emissions due to malfunctions, the permittee has the option to report these as excess emissions of the pound per hour limits in Table 106.A (or the pound per hour limits in condition B110.F, if applicable), in accordance with 20.2.7 NMAC, or include the emissions under the 10 tpy limit.
- (b) Once emissions from a malfunction event are submitted in the final report (due no later than ten days after the end of the excess emissions event) per 20.2.7.110.A(2) NMAC, the event is considered an excess emission and cannot be applied toward the 10 tpy SSM/M limit in this permit.

**(3) Emissions Exceeding the Permit Limit**

If the monthly rolling 12-month total of SSM/M exceeds the 10 tpy emission limit, the permittee shall report the emissions as excess emissions in accordance with 20.2.7.110NMAC.

**(4) Emissions Due to Preventable Events**

Emissions that are due entirely or in part to poor maintenance, careless operation, or any other preventable equipment breakdown shall not be included under the 10 tpy SSM/M emission limit. These emissions shall be reported as excess emissions of the pound per hour limits in Table 106.A (or the pound per hour limits in condition B110F, if applicable) in accordance with 20.2.7 NMAC. (NSR 4221-M6, condition A107.C)

**Monitoring:** The permittee shall monitor all SSM/M events included in the table below:

| Startup, Shutdown and Maintenance and Malfunction (SSM/M) |                                  |   |
|---|----------------------------------|---|
| Activities  | Emission Calculation Methodology | Emission Calculation Equation <sup>1</sup>  |
| Blowdowns<br>Compressors                                  | Mass Balance                     | $\text{Maximum Emissions (tpy)} = [\text{Volume of blowdown (scf/event)}] \times [\text{MW of stream (lb/lb-mol)}] \times [\text{wt \% VOC or speciated constituent}] \times [\text{frequency of events (events/yr)}] / [379.5 \text{ (scf/lb-mol)}] / [2,000 \text{ (lb/ton)}] \times [(100\% - \text{Control Device Efficiency (\%)})]$ |

<sup>1</sup>or equivalent methodology

**Recordkeeping:**

**(1) Compliance Method**

- Each month records shall be kept of the cumulative total of all VOC emissions related to SSM/M during the first 12 months and, thereafter of the monthly rolling 12-month total of SSM/M VOC emissions. Any SSM/M emissions that have been reported in a final excess emissions report per 20.2.7.110.A(2) NMAC, shall be excluded from this total.
- Records shall also be kept of the inlet and residue gas analyses, the weight percent VOC of the gas based on the most recent gas analysis, and of the volume of total gas vented in MMscf used to calculate the VOC emissions due to SSM/M events.
- The permittee shall identify the equipment or activity and shall describe the event that is the source of emissions.

**(2) Emissions included Under Permit Limit or Reported as Excess Emissions**

The permittee shall record whether emissions are included under the 10 tpy permit limit for SSM/M or if the event is included in a final excess emissions report per 20.2.7.110.A(2) NMAC.

**(3) Condition B109 Records**

The permittee shall keep records in accordance with Condition B109 of this permit except for the following:

- (a) The requirement to record the start and end times of SSM/M events shall not apply to venting of known quantities of VOCs as long as the emissions do not exceed the SSM/M emission limit.
- (b) The requirement to record a description of the cause of the event shall not apply to SSM/M events as long as the emissions do not exceed the SSM/M emission limit.

Proposed Draft Permit Conditions

# Section 6

## All Calculations

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**Show all calculations** used to determine both the hourly and annual controlled and uncontrolled emission rates. All calculations shall be performed keeping a minimum of three significant figures. Document the source of each emission factor used (if an emission rate is carried forward and not revised, then a statement to that effect is required). If identical units are being permitted and will be subject to the same operating conditions, submit calculations for only one unit and a note specifying what other units to which the calculations apply. All formulas and calculations used to calculate emissions must be submitted. The "Calculations" tab in the UA2 has been provided to allow calculations to be linked to the emissions tables. Add additional "Calc" tabs as needed. If the UA2 or other spread sheets are used, all calculation spread sheet(s) shall be submitted electronically in Microsoft Excel compatible format so that formulas and input values can be checked. Format all spread sheets and calculations such that the reviewer can follow the logic and verify the input values. Define all variables. If calculation spread sheets are not used, provide the original formulas with defined variables. Additionally, provide subsequent formulas showing the input values for each variable in the formula. All calculations, including those calculations are imbedded in the Calc tab of the UA2 portion of the application, the printed Calc tab(s), should be submitted under this section.

**Tank Flashing Calculations:** The information provided to the AQB shall include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., NOI, permit, or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis. If Hysis is used, all relevant input parameters shall be reported, including separator pressure, gas throughput, and all other relevant parameters necessary for flashing calculation.

**SSM Calculations:** It is the applicant's responsibility to provide an estimate of SSM emissions or to provide justification for not doing so. In this Section, provide emissions calculations for Startup, Shutdown, and Routine Maintenance (SSM) emissions listed in the Section 2 SSM and/or Section 22 GHG Tables and the rational for why the others are reported as zero (or left blank in the SSM/GHG Tables). Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications ([http://www.env.nm.gov/aqb/permit/app\\_form.html](http://www.env.nm.gov/aqb/permit/app_form.html)) for more detailed instructions on calculating SSM emissions. If SSM emissions are greater than those reported in the Section 2, Requested Allowables Table, modeling may be required to ensure compliance with the standards whether the application is NSR or Title V. Refer to the Modeling Section of this application for more guidance on modeling requirements.

**Glycol Dehydrator Calculations:** The information provided to the AQB shall include the manufacturer's maximum design recirculation rate for the glycol pump. If GRI-Glycalc is used, the full input summary report shall be included as well as a copy of the gas analysis that was used.

**Road Calculations:** Calculate fugitive particulate emissions and enter haul road fugitives in Tables 2-A, 2-D and 2-E for:

1. If you transport raw material, process material and/or product into or out of or within the facility and have PER emissions greater than 0.5 tpy.
2. If you transport raw material, process material and/or product into or out of the facility more frequently than one round trip per day.

**Significant Figures:**

- A. All emissions standards are deemed to have at least two significant figures, but not more than three significant figures.
- B. At least 5 significant figures shall be retained in all intermediate calculations.
- C. In calculating emissions to determine compliance with an emission standard, the following rounding off procedures shall be used:
  - (1) If the first digit to be discarded is less than the number 5, the last digit retained shall not be changed;
  - (2) If the first digit discarded is greater than the number 5, or if it is the number 5 followed by at least one digit other than the number zero, the last figure retained shall be increased by one unit; **and**
  - (3) If the first digit discarded is exactly the number 5, followed only by zeros, the last digit retained shall be rounded upward if it is an odd number, but no adjustment shall be made if it is an even number.
  - (4) The final result of the calculation shall be expressed in the units of the standard.

**Control Devices:** In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and 20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device

regardless if the applicant takes credit for the reduction in emissions. The applicant can indicate in this section of the application if they chose to not take credit for the reduction in emission rates. For notices of intent submitted under 20.2.73 NMAC, only uncontrolled emission rates can be considered to determine applicability unless the state or federal Acts require the control. This information is necessary to determine if federally enforceable conditions are necessary for the control device, and/or if the control device produces its own regulated pollutants or increases emission rates of other pollutants.

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**Compressor Engines (Units 17-0585, 13-0104, 17-0590, 17-0529, 17-0530, 17-0533, 17-0534, 18-1279, 1, 2, 3, 4, and 5)**

Uncontrolled emissions of NO<sub>x</sub>, CO, VOC (NMEHC), and formaldehyde (HCHO) from these units were calculated using Caterpillar® manufacturer's data. Emissions of SO<sub>2</sub> were calculated using a fuel sulfur pipeline content of 5 grains total sulfur per 100 scf and an assumed 100% conversion of fuel elemental sulfur to SO<sub>2</sub>. Particulate emissions were calculated based on AP-42 Table 3.2-2 emission factors. The uncontrolled GHG emissions were calculated according to 40 CFR 98 Subparts A and C. HAP emissions were calculated using HAPCalc® 3.01, but the formaldehyde emissions were adjusted based on the engine and catalyst emission rates for the uncontrolled and controlled scenarios, respectively. Controlled engine emissions were based on reduction efficiencies provided in catalyst specification sheets.

**Glycol Dehydrators (Units Dehy-1 and Dehy-2)**

The regenerator and flash tank emissions for Dehy-1 and Dehy-2 are calculated using a BR&E ProMax simulation. The dehydrator configurations include a flash tank that uses recycle and recompression as a control option with an associated 100% efficiency as well as a BTEX condenser. Controlled emissions are represented under the reboilers associated with the glycol dehydrators (Units RBL-1 and RBL-2), which control condenser overhead VOC, HAP and H<sub>2</sub>S emissions with a 95% reduction efficiency.

**Glycol Dehydrator Reboilers (Units RBL-1 and RBL-2)**

Reboiler fuel combustion emissions (Units RBL-1 and RBL-2) are calculated using emission factors from AP-42 Tables 1.4-1 and 1.4-2 while GRI-HAPCalc® 3.01 was used to estimate HAP emissions from the reboiler fuel combustion. Controlled emissions for these units also represent VOC, HAP, and H<sub>2</sub>S emissions from the glycol dehydrator BTEX condenser, which are controlled with a 95% reduction efficiency.

**Amine Unit (Unit Amine-1)**

Acid gas emissions from the amine unit (Unit Amine-1) are calculated using a BR&E ProMax simulation. Controlled emissions from this unit are represented under the process flare (Unit Flare-1), which controls VOCs, H<sub>2</sub>S, and HAPs from the amine unit with a reduction efficiency of 98%.

**Amine Unit Reboiler (Unit RBL-3)**

Reboiler fuel combustion emissions (Unit RBL-3) are calculated using emission factors from AP-42 Tables 1.4-1 and 1.4-2 while GRI-HAPCalc® 3.01 was used to estimate HAP emissions from the reboiler fuel combustion. The amine unit reboiler is not used to control any emissions from the amine unit (Unit Amine-1).

**Assist Gas Process Flare (Unit Flare-1)**

This process flare employs a supplemental fuel gas stream to be able to efficiently combust the acid gas from the amine unit, which has a relatively low heating value. The quantity of assist needed is calculated such that the stream of gas to the flare achieves a heating value of at least 200 Btu/scf. Emissions factors for the flare are referenced from AP-42 Tables 13.5-1 and 13.5-2. Fuel gas is assumed to have H<sub>2</sub>S and SO<sub>2</sub> quantities of 0.25 and 5 gr/scf, respectively.

**Condensate / Oily Waste Water Tanks (Units T-1, T-2, T-3, and T-4)**

Flashing, working, and breathing emissions from the tanks are calculated using a BR&E ProMax simulation representing liquids removed from various processes at the facility.

**Condensate / Oily Waste Water Loading (Unit LOAD)**

Loading emissions from the condensate/waste oil storage tanks are calculated using a BR&E ProMax simulation. This unit is exempt pursuant to 20.2.72.202.B(5) NMAC.

**Unpaved Truck Hauling Emissions (Unit HAUL)**

Unpaved haul road emissions are calculated using AP-42 13.2.2 Equations 1a and 2. This unit is exempt pursuant to 20.2.72.202.B(5) NMAC.

**Fugitive Emissions (Unit FUG)**

Fugitive emissions were calculated using component counts provided by facility engineers and emissions factors referenced from the "Protocol for Equipment Leak Emission Estimates" from the EPA (Table 2-4). Analysis from derived from the BR&E ProMax simulation were used to estimate the composition of Gas and Liquid composition.

**Startup, Shutdown, and Maintenance/Malfunction (Unit SSM/M)**

Targa is requesting 10 tpy VOC emissions associated with Startup, Shutdown and Maintenance (SSM) and Malfunction activities at the facility.

There is one type of blowdown events permitted: compressor blowdowns. Compressor blowdowns are typically associated with SSM activities because they are predictable and they can be scheduled in most cases. Compressor blowdowns occur when units are taken offline for maintenance and/or during startup.

There is potential for emergency events associated with compressors and cannot be anticipated. Emergency compressor shut downs are rare and thus would not be considered SSM events, they are considered malfunctions.

Based on the above description, Targa has determined to request a maximum VOC emission limit of 10 tons per year to account for Startup, Shutdown, and Maintenance/Malfunction (SSM/M). In accordance with "Implementation Guidance for permitting SSM Emissions and Excess Emission" document issued 7 June 2012, "Instead of permitting SSM and upset/malfunction emissions separately, the applicant may request that emissions from both SSM and upset/malfunction be consolidated in the permit with a total limit of 10 tons per year per pollutant per facility for the combined category to reduce concerns about the appropriateness of activities listed as SSM."

# Section 7

## Information Used To Determine Emissions

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### **Information Used to Determine Emissions shall include the following:**

- ☒ If manufacturer data are used, include specifications for emissions units and control equipment, including control efficiencies specifications and sufficient engineering data for verification of control equipment operation, including design drawings, test reports, and design parameters that affect normal operation.
  - ☐ If test data are used, include a copy of the complete test report. If the test data are for an emissions unit other than the one being permitted, the emission units must be identical. Test data may not be used if any difference in operating conditions of the unit being permitted and the unit represented in the test report significantly effect emission rates.
  - ☒ If the most current copy of AP-42 is used, reference the section and date located at the bottom of the page. Include a copy of the page containing the emissions factors, and clearly mark the factors used in the calculations.
  - ☐ If an older version of AP-42 is used, include a complete copy of the section.
  - ☒ If an EPA document or other material is referenced, include a complete copy.
  - ☒ Fuel specifications sheet.
  - ☒ If computer models are used to estimate emissions, include an input summary (if available) and a detailed report, and a disk containing the input file(s) used to run the model. For tank-flashing emissions, include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., permit or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis.
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### **Compressor Engines (Units 17-0585, 13-0104, 17-0590, 17-0529, 17-0530, 17-0533, 17-0534, 18-1279, 1, 2, 3, 4, and 5)**

- AP-42 Table 3.2-2
- 40 CFR Part 98 Table C-1 and C-2
- Manufacturer Engine and Catalyst Specifications
- Fuel Gas Analysis
- GRI HAPCalc 3.01

### **Dehydrators (Units Dehy-1 and Dehy-2)**

- BR&E ProMax
- Thistle Loop CDP Field Gas Analysis (dated 10/01/2018)
- Woodward CDP Field Gas Analysis (dated 9/01/2018)

### **Glycol Dehydrator Reboilers (Units RBL-1 and RBL-2)**

- AP-42 Table 1.4-1 and 1.4-2
- BR&E ProMax
- Thistle Loop CDP Field Gas Analysis (dated 10/01/2018)
- Woodward CDP Field Gas Analysis (dated 9/01/2018)
- 40 CFR 98 Subparts A and C

### **Amine Unit Reboiler (Unit RBL-3)**

- AP-42 Table 1.4-1 and 1.4-2

### **Amine Unit (Unit Amine-1)**

- BR&E ProMax
- Frac Cat Compressor Station Gas Analysis (dated 10/9/2018)

### **Assist Gas Process Flare (Unit Flare-1)**

- BR&E ProMax – Acid Gas Stream
- Emissions factors from AP-42 Tables 13.5-1 and 13.5-2
- Flare manufacturer specifications



**Tanks (Units T-1, T-2, T-3, and T-4)**

- BR&E ProMax
- Thistle Loop CDP Field Gas Analysis (dated 10/01/2018)
- Windward CDP Field Gas Analysis (dated 9/01/2018)

**Condensate / Oily Waste Water Loading Emissions (LOAD)**

- BR&E ProMax
- Thistle Loop CDP Field Gas Analysis (dated 10/01/2018)
- Windward CDP Field Gas Analysis (dated 9/01/2018)

**Unpaved Haul Road Emissions (HAUL)**

- Emissions factors from AP-42 Tables 13.2.2 Equations 1a and 2

**Fugitive Emission (Unit FUG)**

- Component counts from facility engineers
- Liquid and Gas analyses derived from a BR&E ProMax simulation
- Emissions factors referenced from the Protocol for Equipment Leak Emission Estimates from the EPA (Table 2-4).

**Startup, Shutdown & Maintenance and Malfunction Emission (Unit SSM/M)**

- Engine count per engine type
- Inlet gas Analysis Gas analyses
- Compressor, engine and piping dimensions along with temperature and pressure use to determine the volume for compressor blow downs. Emissions from venting activities are calculated based on a mass balance calculation.

Targa Northern Delaware LLC: Frac Cat Compressor Station

SSM/M Emissions

Unit: SSM/M  
Description: Startup, Shutdown, Maintenance, and Malfunction Venting  
Control Equipment: N/A

Compressor Blowdowns

| Compressor | Number of Compressors | Volume per Compressor (scf/event) | Annual events per compresor <sup>1</sup> | Annual Release (scf/yr) | Hourly Volume (scf/hr) | Molecular Weight (lb/lb-mol) | HAP (wt%) | VOC (wt%) | H <sub>2</sub> S (wt%)         | VOC (lb/hr) | VOC (tpy) | H <sub>2</sub> S (lb/hr) | H <sub>2</sub> S (tpy) | HAP (lb/hr) | HAP (tpy) | Benzene (lb/hr) | Benzene (tpy) |
|------------|-----------------------|-----------------------------------|--|-------------------------|------------------------|------------------------------|-----------|-----------|--------------------------------|-------------|-----------|--------------------------|------------------------|-------------|-----------|-----------------|---------------|
| Cat 3520   | 1                     | 3185.8                            | 30                                       | 95,574                  | 3,186                  | 22.6                         | 0.281     | 23%       | 0.00000%                       | 43.60       | 0.65      | 0.00                     | 0.00000                | 0.53        | 0.01      | 0.21            | 0.00          |
| Cat 3516   | 8                     | 3185.8                            | 31                                       | 790,078                 | 25,486                 | 22.6                         | 0.281     | 23%       | 0.00000%                       | 348.77      | 5.41      | 0.00                     | 0.00000                | 4.26        | 0.07      | 1.67            | 0.03          |
| Cat 3606   | 3                     | 4285.9                            | 30                                       | 385,731                 | 12,858                 | 22.6                         | 0.281     | 23%       | 0.00000%                       | 175.95      | 2.64      | 0.00                     | 0.00000                | 2.15        | 0.03      | 0.84            | 0.01          |
| Cat 3608   | 1                     | 6184.9                            | 30                                       | 185,547                 | 6,185                  | 22.6                         | 0.281     | 23%       | 0.00000%                       | 84.64       | 1.27      | 0.00                     | 0.00000                | 1.03        | 0.02      | 0.40            | 0.01          |
|            |                       |                                   |  |                         |                        |                              |           |           | Total:                         | 652.96      | 9.97      | 0.00                     | 0.00000                | 7.45        | 0.11      | 2.91            | 0.04          |
|            |                       |                                   |  |                         |                        |                              |           |           | Requested Limit <sup>2</sup> : | 2.28        | 9.97      | 0.00                     | 0.00000                | 7.45        | 0.11      | 2.91            | 0.04          |

1. Annual events account for malfunction and SSM event for the compressor blowdowns.  
2. Requested limit is based on NMED guidance documents that allow facilities 10 tpy of combined SSM and Malfunction.

**Basis of Calculation:**  
Emissions from venting activities are calculated based on a mass balance as follows:  

Hourly Emissions (lb/hr) = [Volume of Gas Vented (scf/event)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] / [379.5 (scf/lb-mol)]  
Uncontrolled Annual Emissions (tpy) = [Volume of Gas Vented (scf/yr)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] / [379.5 (scf/lb-mol)]

\*Volumes determined by field measurements of compressors. The actual volume is adjusted for temperature and pressure to determine the compressor blow down volume in SCF.

| Unit    | Engine    | ES, N (ft3) | lbs VOC per event | Events per year | lbs/year | TPY  |
|---------|-----------|-------------|-------------------|-----------------|----------|------|
| 17-0533 | Cat G3520 | 3185.8      | 43.6              | 30              | 1307.9   | 0.7  |
| 17-0534 | Cat G3516 | 3185.8      | 43.6              | 31              | 1351.5   | 0.7  |
| 17-0535 | Cat G3516 | 3185.8      | 43.6              | 31              | 1351.5   | 0.7  |
| 17-0529 | Cat G3516 | 3185.8      | 43.6              | 31              | 1351.5   | 0.7  |
| 17-0590 | Cat G3516 | 3185.8      | 43.6              | 31              | 1351.5   | 0.7  |
| 13-0104 | Cat G3516 | 3185.8      | 43.6              | 31              | 1351.5   | 0.7  |
| 17-0585 | Cat G3606 | 4285.9      | 58.7              | 30              | 1759.5   | 0.9  |
| 18-1279 | Cat G3516 | 3185.8      | 43.6              | 31              | 1351.5   | 0.7  |
| 1       | Cat G3516 | 3185.8      | 43.6              | 31              | 1351.5   | 0.7  |
| 2       | Cat G3516 | 3185.8      | 43.6              | 31              | 1351.5   | 0.7  |
| 3       | Cat G3606 | 4285.9      | 58.7              | 30              | 1759.5   | 0.9  |
| 4       | Cat G3606 | 4285.9      | 58.7              | 30              | 1759.5   | 0.9  |
| 5       | Cat G3608 | 6184.9      | 84.6              | 30              | 2539.1   | 1.3  |
| Total:  |           |             |                   |                 |          | 9.97 |

|   |                 |                |                |           |                  |            |           |             |
|---|-----------------|----------------|----------------|-----------|------------------|------------|-----------|-------------|
| Unit: \$ - KBE-4 13.5 Cd                |                 | Engine:        | 3516           |           | Compressor:      | KBE-4      |           |             |
| Ambient Air Temperature:                |                 | 110            |                |           |                  |            |           |             |
|   | lbs/sq in (abs) | Temp (F)       | Vol. (ft^3)    | Actual CF | lbs/sq in (gage) |            |           |             |
| 1st Stage Suction                       | 263.15          | 100.00         | 53.12          | 986.85    | 250.00           |            |           |             |
| 1st Stage Discharge                     | 263.15          | 261.00         | 34.21          | 493.62    | 250.00           |            |           |             |
| 2nd Stage Suction                       | 263.15          | 120.00         | 40.97          | 734.94    | 250.00           |            |           |             |
| 2nd Stage Discharge                     | 263.15          | 248.00         | 20.81          | 305.75    | 250.00           |            |           |             |
| 3rd Stage Suction                       | 263.15          | 120.00         | 19.13          | 343.22    | 250.00           |            |           |             |
| 3rd Stage Discharge                     | 263.15          | 262.00         | 12.62          | 181.92    | 250.00           |            |           |             |
| 4th Stage Suction                       | 13.15           |                | 0.00           | 0.00      |                  |            |           |             |
| 4th Stage Discharge                     | 13.15           |                | 0.00           | 0.00      |                  |            |           |             |
| Bypass (downstream of PCV)              | 263.15          | 120.00         | 7.78           | 139.52    | 250.00           |            |           |             |
| Total                                   |                 |                | 188.65         | 3,185.82  |                  |            |           |             |
| Settle Out Pressure (Gauge):            |                 | 209.0          |                |           |                  |            |           |             |
| Settle Out Pressure @ Ambient Temp:     |                 | 215.0          |                |           |                  |            |           |             |
| Settle Out Temperature (Degrees F):     |                 | 156.0          |                |           |                  |            |           |             |
| Blowdown Volume (SCF):                  |                 | 3,185.8        |                |           |                  |            |           |             |
|   | O.D. (in)       | Nom. Thk. (in) | Actual ID (in) | L. (in.)  | Volume/Lin.Ft    | Shell Vol. | Head Vol. | Vol. (ft^3) |
| 1st Stage Suction Piping - A            | 12"-SCH 100     | 0.432          | 5.761          | 30.13     |                  |            |           | 0.454       |
| 1st Stage Suction Piping - B            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 1st Stage Suction Piping - C            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 1st Stage Suction Piping - D            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 1st Stage Suction Scrubber              | 30.00           | 0.500          | 29.000         | 78.00     | 4.587            | 29.815     | 1.848     | 33.510      |
| 1st Stage Suction Bottle                | 24.00           | 0.500          | 23.000         | 72.00     | 2.885            | 17.311     | 0.922     | 19.155      |
| 1st Stage Discharge Bottle              | 20.00           | 0.500          | 19.000         | 120.00    | 1.969            | 19.689     | 0.520     | 20.729      |
| 1st Stage Discharge Piping - A          | 8"-SCH 40       | 0.322          | 7.981          | 276.00    |                  |            |           | 7.990       |
| 1st Stage Discharge Piping - B          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 1st Stage Discharge Piping - C          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 1st Stage Discharge Piping - D          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 1st Stage Compressor-Suction Passages   | Volume (in^3)   |                |                |           |                  |            |           | 0.000       |
| 1st Stage Compressor-Discharge Passages | Volume (in^3)   |                |                |           |                  |            |           | 0.000       |
| 1st Stage Cooler Volume                 | Volume (in^3)   |                |                |           |                  |            |           | 5.490       |
| 2nd Stage Suction Piping - A            | 8"-SCH 40       | 0.322          | 7.981          | 145.75    |                  |            |           | 4.220       |
| 2nd Stage Suction Piping - B            | 8"-SCH 40       | 0.322          | 7.981          | 367.94    |                  |            |           | 10.652      |
| 2nd Stage Suction Piping - C            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 2nd Stage Suction Piping - D            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 2nd Stage Suction Scrubber              | 24.00           | 0.500          | 23.000         | 72.00     | 2.885            | 17.311     | 0.922     | 19.155      |
| 2nd Stage Suction Bottle                | 20.00           | 0.500          | 19.000         | 36.00     | 1.969            | 5.907      | 0.520     | 6.946       |
| 2nd Stage Discharge Bottle              | 18.00           | 0.750          | 16.500         | 60.00     | 1.485            | 7.424      | 0.340     | 8.105       |
| 2nd Stage Discharge Piping - A          | 6"-SCH 40       | 0.280          | 6.065          | 243.31    |                  |            |           | 4.068       |
| 2nd Stage Discharge Piping - B          | 6"-SCH 40       | 0.280          | 6.065          | 160.56    |                  |            |           | 2.684       |
| 2nd Stage Discharge Piping - C          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 2nd Stage Discharge Piping - D          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - A  | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - B1 | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - B2 | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - C  | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - D  | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - E  | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - F  | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 2nd Stage AC Piping - A                 | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 2nd Stage Compressor-Suction Passages   | Volume (in^3)   |                |                |           |                  |            |           | 0.000       |
| 2nd Stage Compressor-Discharge Passages | Volume (in^3)   |                |                |           |                  |            |           | 0.000       |
| 2nd Stage Cooler Volume                 | Volume (in^3)   |                |                |           |                  |            |           | 5.950       |
| 3rd Stage Suction Piping - A            | 6"-SCH 40       | 0.280          | 6.065          | 258.94    |                  |            |           | 4.329       |
| 3rd Stage Suction Piping - B            | 4"-SCH 160      | 0.531          | 3.438          | 34.25     |                  |            |           | 0.184       |
| 3rd Stage Suction Piping - C            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 3rd Stage Suction Piping - D            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 3rd Stage Suction Scrubber              | 20.00           | 0.812          | 18.376         | 72.00     | 1.841            | 11.045     | 0.470     | 11.985      |
| 3rd Stage Suction Bottle                | 14.00           | 0.500          | 13.000         | 30.00     | 0.921            | 2.303      | 0.166     | 2.636       |
| 3rd Stage Discharge Bottle              | 14.00           | 0.937          | 12.126         | 61.00     | 0.802            | 4.075      | 0.135     | 4.345       |
| 3rd Stage Discharge Piping - A          | 4"-SCH 120      | 0.438          | 3.624          | 241.81    |                  |            |           | 1.443       |
| 3rd Stage Discharge Piping - B          | 4"-SCH 120      | 0.438          | 3.624          | 43.00     |                  |            |           | 0.257       |
| 3rd Stage Discharge Piping - C          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 3rd Stage Discharge Piping - D          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 3rd Stage Compressor-Suction Passages   | Volume (in^3)   |                |                |           |                  |            |           |             |
| 3rd Stage Compressor-Discharge Passages | Volume (in^3)   |                |                |           |                  |            |           |             |
| 3rd Stage Cooler Volume                 | Volume (in^3)   |                |                |           |                  |            |           | 6.580       |
| 4th Stage Suction Piping - A            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 4th Stage Suction Piping - B            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 4th Stage Suction Piping - C            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 4th Stage Suction Piping - D            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 4th Stage Suction Scrubber              |                 |                | 0.000          | 0.00      | #DIV/0!          | 0.000      | 0.000     | 0.000       |
| 4th Stage Suction Bottle                |                 |                | 0.000          | 0.00      | #DIV/0!          | 0.000      | 0.000     | 0.000       |
| 4th Stage Discharge Bottle              |                 |                | 0.000          | 0.00      | #DIV/0!          | 0.000      | 0.000     | 0.000       |
| 4th Stage Discharge Piping - A          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 4th Stage Discharge Piping - B          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 4th Stage Discharge Piping - C          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 4th Stage Discharge Piping - D          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 4th Stage Compressor-Suction Passages   | Volume (in^3)   | ----->         |                |           |                  |            |           |             |
| 4th Stage Compressor-Discharge Passages | Volume (in^3)   | ----->         |                |           |                  |            |           |             |
| 4th Stage Cooler Volume                 |                 | ----->         |                |           |                  |            |           |             |
| Bypass piping - A                       | 6"-SCH 120      | 0.562          | 5.501          | 216.13    |                  |            |           | 2.973       |
| Bypass piping - B                       | 6"-SCH 120      | 0.562          | 5.501          | 303.44    |                  |            |           | 4.173       |
| Bypass piping - C                       | 4"-SCH 80 X     | 0.337          | 3.826          | 93.44     |                  |            |           | 0.622       |
| Bypass piping - D                       | 1"-SCH 160      | 0.250          | 0.815          | 33.81     |                  |            |           | 0.010       |

91,790.41  
59,113.31  
70,800.53  
35,955.17  
33,063.89  
21,815.86  
0.00  
35,955.17  
13,440.29  
325,979.46

|   |                 |                |                |           |                  |            |           |             |
|---|-----------------|----------------|----------------|-----------|------------------|------------|-----------|-------------|
| Unit: 506 - JGD-4 Conf                  |                 | Engine:        | 3606           |           | Compressor:      | JGD-4      |           |             |
| Ambient Air Temperature:                |                 | 110            |                |           |                  |            |           |             |
|   | lbs/sq in (abs) | Temp (F)       | Vol. (ft^3)    | Actual CF | lbs/sq in (gage) |            |           |             |
| 1st Stage Suction                       | 263.15          | 100.00         | 71.90          | 1,335.70  | 250.00           |            |           |             |
| 1st Stage Discharge                     | 263.15          | 234.58         | 49.06          | 734.90    | 250.00           |            |           |             |
| 2nd Stage Suction                       | 263.15          | 120.00         | 49.90          | 895.06    | 250.00           |            |           |             |
| 2nd Stage Discharge                     | 263.15          | 250.92         | 31.29          | 457.94    | 250.00           |            |           |             |
| 3rd Stage Suction                       | 263.15          | 120.00         | 22.80          | 408.94    | 250.00           |            |           |             |
| 3rd Stage Discharge                     | 263.15          | 252.60         | 17.99          | 262.63    | 250.00           |            |           |             |
| 4th Stage Suction                       | 13.15           |                | 0.00           | 0.00      |                  |            |           |             |
| 4th Stage Discharge                     | 13.15           |                | 0.00           | 0.00      |                  |            |           |             |
| Bypass (downstream of PCV)              | 263.15          | 120.00         | 10.63          | 190.76    | 250.00           |            |           |             |
| Total                                   |                 |                | 253.57         | 4,285.93  |                  |            |           |             |
| Settle Out Pressure (Gauge):            |                 | 209.2          |                |           |                  |            |           |             |
| Settle Out Pressure @ Ambient Temp:     |                 | 215.4          |                |           |                  |            |           |             |
| Settle Out Temperature (Degrees F):     |                 | 155.5          |                |           |                  |            |           |             |
| Blowdown Volume (SCF):                  |                 | 4,285.9        |                |           |                  |            |           |             |
|   | O.D. (in)       | Nom. Thk. (in) | Actual ID (in) | L. (in.)  | Volume/Lin.Ft    | Shell Vol. | Head Vol. | Vol. (ft^3) |
| 1st Stage Suction Piping - A            | 12"-SCH 100     | 0.432          | 5.761          | 30.13     |                  |            |           | 0.454       |
| 1st Stage Suction Piping - B            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 1st Stage Suction Piping - C            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 1st Stage Suction Piping - D            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 1st Stage Suction Scrubber              | 30.00           | 0.625          | 28.750         | 96.00     | 4.508            | 36.066     | 1.800     | 39.666      |
| 1st Stage Suction Bottle                | 30.00           | 0.625          | 28.750         | 75.00     | 4.508            | 28.176     | 1.800     | 31.777      |
| 1st Stage Discharge Bottle              | 24.00           | 0.562          | 22.876         | 132.00    | 2.854            | 31.396     | 0.907     | 33.210      |
| 1st Stage Discharge Piping - A          | 8"-SCH 40       | 0.322          | 7.981          | 281.65    |                  |            |           | 8.154       |
| 1st Stage Discharge Piping - B          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 1st Stage Discharge Piping - C          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 1st Stage Discharge Piping - D          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 1st Stage Compressor-Suction Passages   | Volume (in^3)   |                |                |           |                  |            |           | 0.000       |
| 1st Stage Compressor-Discharge Passages | Volume (in^3)   |                |                |           |                  |            |           | 0.000       |
| 1st Stage Cooler Volume                 | Volume (in^3)   |                |                |           |                  |            |           | 7.700       |
| 2nd Stage Suction Piping - A            | 8"-SCH 40       | 0.322          | 7.981          | 415.31    |                  |            |           | 12.024      |
| 2nd Stage Suction Piping - B            | 8"-SCH 40       | 0.322          | 7.981          | 151.06    |                  |            |           | 4.373       |
| 2nd Stage Suction Piping - C            | 6"-SCH 160      | 0.718          | 5.189          | 31.13     |                  |            |           | 0.381       |
| 2nd Stage Suction Piping - D            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 2nd Stage Suction Scrubber              | 24.00           | 0.562          | 22.876         | 90.00     | 2.854            | 21.407     | 0.907     | 23.220      |
| 2nd Stage Suction Bottle                | 24.00           | 0.562          | 22.876         | 34.00     | 2.854            | 8.087      | 0.907     | 9.901       |
| 2nd Stage Discharge Bottle              | 24.00           | 0.688          | 22.624         | 65.00     | 2.792            | 15.122     | 0.877     | 16.876      |
| 2nd Stage Discharge Piping - A          | 6"-SCH 40       | 0.280          | 6.065          | 440.00    |                  |            |           | 7.356       |
| 2nd Stage Discharge Piping - B          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 2nd Stage Discharge Piping - C          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 2nd Stage Discharge Piping - D          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - A  | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - B1 | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - B2 | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - C  | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - D  | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - E  | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - F  | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 2nd Stage AC Piping - A                 | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 2nd Stage Compressor-Suction Passages   | Volume (in^3)   |                |                |           |                  |            |           | 0.000       |
| 2nd Stage Compressor-Discharge Passages | Volume (in^3)   |                |                |           |                  |            |           | 0.000       |
| 2nd Stage Cooler Volume                 | Volume (in^3)   |                |                |           |                  |            |           | 7.060       |
| 3rd Stage Suction Piping - A            | 6"-SCH 40       | 0.280          | 6.065          | 259.00    |                  |            |           | 4.330       |
| 3rd Stage Suction Piping - B            | 4"-SCH 160      | 0.531          | 3.438          | 46.75     |                  |            |           | 0.251       |
| 3rd Stage Suction Piping - C            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 3rd Stage Suction Piping - D            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 3rd Stage Suction Scrubber              | 20.00           | 0.812          | 18.376         | 84.00     | 1.841            | 12.886     | 0.470     | 13.826      |
| 3rd Stage Suction Bottle                | 18.00           | 0.750          | 16.500         | 30.00     | 1.484            | 3.710      | 0.340     | 4.391       |
| 3rd Stage Discharge Bottle              | 16.00           | 1.031          | 13.938         | 66.00     | 1.059            | 5.825      | 0.205     | 6.235       |
| 3rd Stage Discharge Piping - A          | 4"-SCH 80 X     | 0.337          | 3.826          | 279.38    |                  |            |           | 1.859       |
| 3rd Stage Discharge Piping - B          | 4"-SCH 80 X     | 0.337          | 3.826          | 30.88     |                  |            |           | 0.205       |
| 3rd Stage Discharge Piping - C          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 3rd Stage Discharge Piping - D          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 3rd Stage Compressor-Suction Passages   | Volume (in^3)   |                |                |           |                  |            |           |             |
| 3rd Stage Compressor-Discharge Passages | Volume (in^3)   |                |                |           |                  |            |           |             |
| 3rd Stage Cooler Volume                 | Volume (in^3)   |                |                |           |                  |            |           | 9.690       |
| 4th Stage Suction Piping - A            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 4th Stage Suction Piping - B            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 4th Stage Suction Piping - C            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 4th Stage Suction Piping - D            | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 4th Stage Suction Scrubber              |                 |                | 0.000          | 0.00      | #DIV/0!          | 0.000      | 0.000     | 0.000       |
| 4th Stage Suction Bottle                |                 |                | 0.000          | 0.00      | #DIV/0!          | 0.000      | 0.000     | 0.000       |
| 4th Stage Discharge Bottle              |                 |                | 0.000          | 0.00      | #DIV/0!          | 0.000      | 0.000     | 0.000       |
| 4th Stage Discharge Piping - A          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 4th Stage Discharge Piping - B          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 4th Stage Discharge Piping - C          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 4th Stage Discharge Piping - D          | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| 4th Stage Compressor-Suction Passages   | Volume (in^3)   | ----->         |                |           |                  |            |           |             |
| 4th Stage Compressor-Discharge Passages | Volume (in^3)   | ----->         |                |           |                  |            |           |             |
| 4th Stage Cooler Volume                 |                 | ----->         |                |           |                  |            |           |             |
| Bypass piping - A                       | 4"-SCH 80 X     | 0.337          | 3.826          | 93.44     |                  |            |           | 0.622       |
| Bypass piping - B                       | 6"-SCH 40       | 0.280          | 6.065          | 598.38    |                  |            |           | 10.004      |
| Bypass piping - C                       | Select One      | 0.000          | 0.000          | 0.00      |                  |            |           | 0.000       |
| Bypass piping - D                       | 1"-SCH 160      | 0.250          | 0.815          | 30.06     |                  |            |           | 0.009       |

124,237.81  
84,782.94  
86,225.38  
54,073.19  
39,395.05  
31,085.12  
0.00  
54,073.19  
18,377.13  
438,176.63

|   |                 |                |                |                   |                  |            |           |             |
|---|-----------------|----------------|----------------|-------------------|------------------|------------|-----------|-------------|
| Unit: 3608 - JGC-4                        |                 | Engine: 3608   |                | Compressor: JGC-4 |                  |            |           |             |
| Ambient Air Temperature: 110              |                 |                |                |                   |                  |            |           |             |
|   | lbs/sq in (abs) | Temp (F)       | Vol. (ft^3)    | Actual CF         | lbs/sq in (gage) |            |           |             |
| 1st Stage Suction                         | 63.15           | 100.00         | 74.58          | 332.52            | 50.00            |            |           |             |
| 1st Stage Discharge                       | 202.67          | 256.48         | 63.48          | 709.89            | 189.52           |            |           |             |
| 2nd Stage Suction                         | 202.67          | 120.00         | 54.13          | 747.86            | 189.52           |            |           |             |
| 2nd Stage Discharge                       | 494.11          | 245.50         | 38.48          | 1,065.44          | 480.96           |            |           |             |
| 3rd Stage Suction                         | 494.11          | 120.00         | 27.43          | 923.82            | 480.96           |            |           |             |
| 3rd Stage Discharge                       | 1,213.15        | 258.12         | 25.14          | 1,678.72          | 1200.00          |            |           |             |
| 4th Stage Suction                         | 13.15           |                | 0.00           | 0.00              |                  |            |           |             |
| 4th Stage Discharge                       | 13.15           |                | 0.00           | 0.00              |                  |            |           |             |
| Bypass (downstream of PCV)                | 1,213.15        | 120.00         | 8.79           | 726.69            | 1200.00          |            |           |             |
| Total                                     |                 |                | 292.02         | 6,184.94          |                  |            |           |             |
| Settle Out Pressure (Gauge): 265.4        |                 |                |                |                   |                  |            |           |             |
| Settle Out Pressure @ Ambient Temp: 256.8 |                 |                |                |                   |                  |            |           |             |
| Settle Out Temperature (Degrees F): 193.7 |                 |                |                |                   |                  |            |           |             |
| Blowdown Volume (SCF): 6,184.9            |                 |                |                |                   |                  |            |           |             |
|   | O.D. (in)       | Nom. Thk. (in) | Actual ID (in) | L. (in.)          | Volume/Lin.Ft    | Shell Vol. | Head Vol. | Vol. (ft^3) |
| 1st Stage Suction Piping - A              | 12"-SCH 100     | 0.432          | 5.761          | 24.00             |                  |            |           | 0.362       |
| 1st Stage Suction Piping - B              | 10"-SCH 140     | 1.000          | 8.750          | 31.13             |                  |            |           | 1.083       |
| 1st Stage Suction Piping - C              | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 1st Stage Suction Piping - D              | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 1st Stage Suction Scrubber                | 30.00           | 0.500          | 29.000         | 96.00             | 4.587            | 36.696     | 1.848     | 40.391      |
| 1st Stage Suction Bottle                  | 30.00           | 0.500          | 29.000         | 76.00             | 4.587            | 29.051     | 1.848     | 32.746      |
| 1st Stage Discharge Bottle                | 24.00           | 0.500          | 23.000         | 144.00            | 2.885            | 34.623     | 0.922     | 36.466      |
| 1st Stage Discharge Piping - A            | 8"-SCH 40       | 0.322          | 7.981          | 263.94            |                  |            |           | 7.641       |
| 1st Stage Discharge Piping - B            | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 1st Stage Discharge Piping - C            | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 1st Stage Discharge Piping - D            | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 1st Stage Compressor-Suction Passages     | Volume (in^3)   |                |                |                   |                  |            |           | 0.000       |
| 1st Stage Compressor-Discharge Passages   | Volume (in^3)   |                |                |                   |                  |            |           | 0.000       |
| 1st Stage Cooler Volume                   | Volume (in^3)   |                |                |                   |                  |            |           | 19.370      |
| 2nd Stage Suction Piping - A              | 8"-SCH 40       | 0.322          | 7.981          | 853.50            |                  |            |           | 24.710      |
| 2nd Stage Suction Piping - B              | 6"-SCH 120      | 0.562          | 5.501          | 49.88             |                  |            |           | 0.686       |
| 2nd Stage Suction Piping - C              | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 2nd Stage Suction Piping - D              | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 2nd Stage Suction Scrubber                | 22.00           | 0.500          | 21.000         | 84.00             | 2.405            | 16.837     | 0.702     | 18.240      |
| 2nd Stage Suction Bottle                  | 24.00           | 0.500          | 23.000         | 36.00             | 2.885            | 8.656      | 0.922     | 10.499      |
| 2nd Stage Discharge Bottle                | 24.00           | 0.688          | 22.624         | 68.50             | 2.792            | 15.936     | 0.877     | 17.690      |
| 2nd Stage Discharge Piping - A            | 6"-SCH 40       | 0.280          | 6.065          | 474.81            |                  |            |           | 7.938       |
| 2nd Stage Discharge Piping - B            | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 2nd Stage Discharge Piping - C            | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 2nd Stage Discharge Piping - D            | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - A    | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - B1   | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - B2   | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - C    | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - D    | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - E    | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| Bypass Piping - High Pressure Side - F    | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 2nd Stage AC Piping - A                   | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 2nd Stage Compressor-Suction Passages     | Volume (in^3)   |                |                |                   |                  |            |           | 0.000       |
| 2nd Stage Compressor-Discharge Passages   | Volume (in^3)   |                |                |                   |                  |            |           | 0.000       |
| 2nd Stage Cooler Volume                   | Volume (in^3)   |                |                |                   |                  |            |           | 12.850      |
| 3rd Stage Suction Piping - A              | 6"-SCH 40       | 0.280          | 6.065          | 328.19            |                  |            |           | 5.487       |
| 3rd Stage Suction Piping - B              | 4"-SCH 80 X     | 0.337          | 3.826          | 49.75             |                  |            |           | 0.331       |
| 3rd Stage Suction Piping - C              | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 3rd Stage Suction Piping - D              | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 3rd Stage Suction Scrubber                | 20.00           | 0.500          | 19.000         | 84.00             | 1.968            | 13.776     | 0.520     | 14.815      |
| 3rd Stage Suction Bottle                  | 20.00           | 0.594          | 18.812         | 36.00             | 1.929            | 5.788      | 0.504     | 6.796       |
| 3rd Stage Discharge Bottle                | 20.00           | 1.031          | 17.938         | 72.00             | 1.754            | 10.525     | 0.437     | 11.399      |
| 3rd Stage Discharge Piping - A            | 4"-SCH 80 X     | 0.337          | 3.826          | 578.88            |                  |            |           | 3.851       |
| 3rd Stage Discharge Piping - B            | 2"-SCH 80 X     | 0.218          | 1.939          | 84.63             |                  |            |           | 0.145       |
| 3rd Stage Discharge Piping - C            | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 3rd Stage Discharge Piping - D            | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 3rd Stage Compressor-Suction Passages     | Volume (in^3)   |                |                |                   |                  |            |           |             |
| 3rd Stage Compressor-Discharge Passages   | Volume (in^3)   |                |                |                   |                  |            |           |             |
| 3rd Stage Cooler Volume                   | Volume (in^3)   |                |                |                   |                  |            |           | 9.740       |
| 4th Stage Suction Piping - A              | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 4th Stage Suction Piping - B              | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 4th Stage Suction Piping - C              | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 4th Stage Suction Piping - D              | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 4th Stage Suction Scrubber                |                 |                | 0.000          | 0.00              | #DIV/0!          | 0.000      | 0.000     | 0.000       |
| 4th Stage Suction Bottle                  |                 |                | 0.000          | 0.00              | #DIV/0!          | 0.000      | 0.000     | 0.000       |
| 4th Stage Discharge Bottle                |                 |                | 0.000          | 0.00              | #DIV/0!          | 0.000      | 0.000     | 0.000       |
| 4th Stage Discharge Piping - A            | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 4th Stage Discharge Piping - B            | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 4th Stage Discharge Piping - C            | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 4th Stage Discharge Piping - D            | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| 4th Stage Compressor-Suction Passages     | Volume (in^3)   |                |                |                   |                  |            |           |             |
| 4th Stage Compressor-Discharge Passages   | Volume (in^3)   |                |                |                   |                  |            |           |             |
| 4th Stage Cooler Volume                   |                 |                |                |                   |                  |            |           |             |
| Bypass piping - A                         | 6"-SCH 40       | 0.280          | 6.065          | 525.63            |                  |            |           | 8.788       |
| Bypass piping - B                         | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| Bypass piping - C                         | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |
| Bypass piping - D                         | Select One      | 0.000          | 0.000          | 0.00              |                  |            |           | 0.000       |

128,876.71  
109,689.17  
93,544.69  
66,491.06  
47,397.30  
43,433.56  
0.00  
66,491.06  
15,185.44  
504,617.93





|   |
|---|
| CENTER OF GRAVITY IS FOR SHIPPING WEIGHT ONLY |
| X= 194.6"                                     |
| Y= 4.8"                                       |
| Z= 14.2"                                      |

|      |       |      |        |      |  |          |
|------|-------|------|--------|------|--|----------|
| P    | 1     | 1"   | 2000#  | FNPT | PACKING VENT DRAIN                       | 22 3/4"  |
| O    | 4     | 2"   | 2000#  | FNPT | SKID DRAIN BOXES                         | 6"       |
| N    | 1     | 1"   | 2000#  | FNPT | ENGINE/COMPRESSOR LUBE OIL MAKE-UP       | 22 3/4"  |
| M    | 1     | 2"   | 2000#  | FNPT | DISTANCE PIECE DRAIN                     | 23 5/16" |
| J    | 1     | 1"   | 2000#  | FNPT | EJW/TAW LOW POINT DRAIN                  | 22 3/4"  |
| H    | 1     | 2"   | 2000#  | FNPT | ENGINE/COMPRESSOR OIL DRAIN              | 23 5/16" |
| F2   | 1     | 1"   | 2000#  | FNPT | 1ST/2ND INTERSTAGE SCRUBBER DRAIN HEADER | 22 3/4"  |
| F1   | 1     | 1"   | 2000#  | FNPT | SCRUBBER DRAIN HEADER                    | 22 3/4"  |
| E    | 1     | 2"   | 2000#  | FNPT | FUEL GAS INLET                           | 23 5/16" |
| D    | 1     | 2"   | 2000#  | FNPT | START GAS INLET                          | 23 5/16" |
| B    | 1     | 4"   | 900#   | RF   | UNIT DISCHARGE                           | 17 9/16" |
| A    | 1     | 10"  | 300#   | RF   | UNIT INLET                               | 74 9/16" |
| MARK | QUAN. | SIZE | RATING | TYPE | SERVICE                                  | ELEV.    |


**CUSTOMER CONNECTION SCHEDULE**

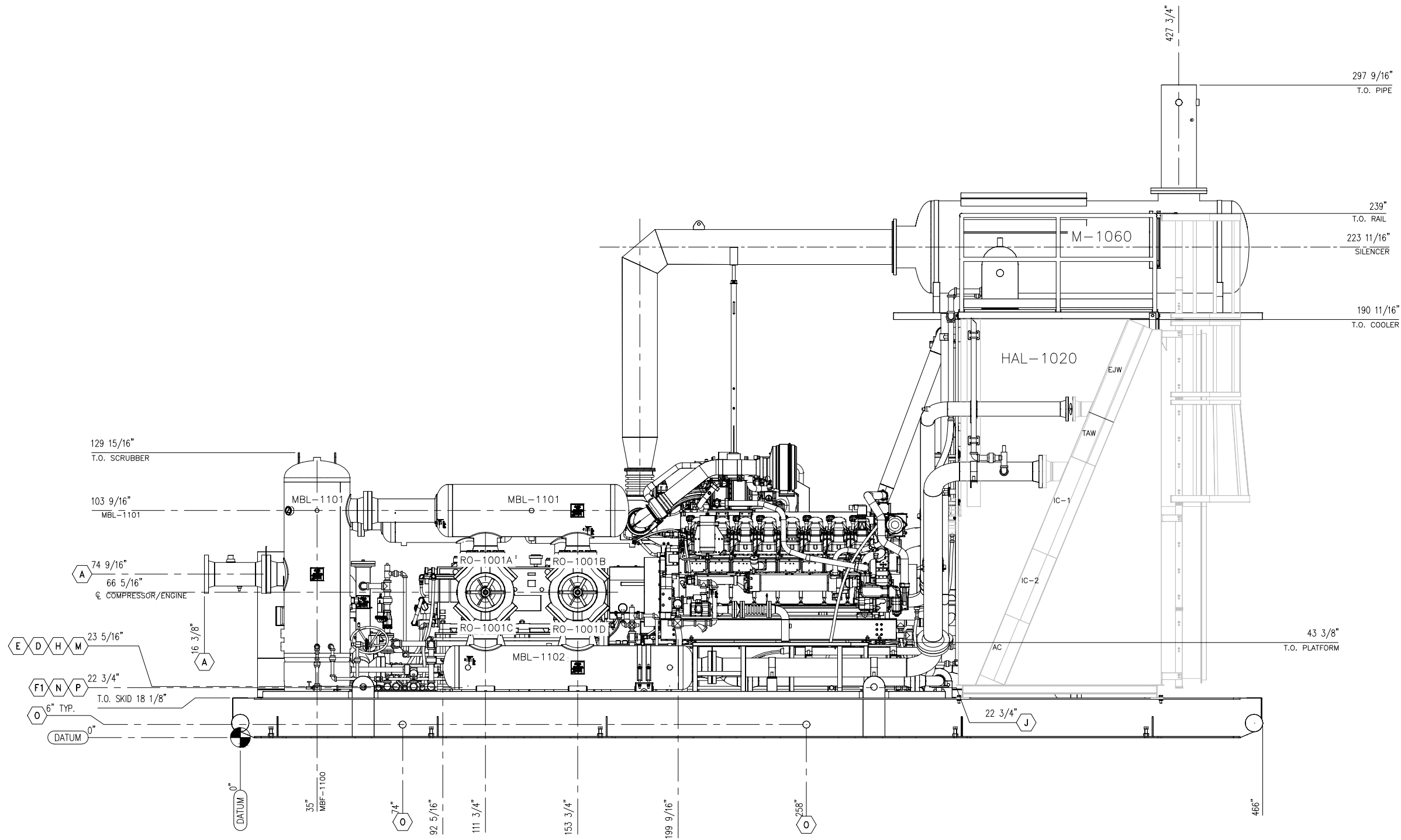
|                  |   |
|------------------|---|
| COMPRESSOR       | ARIEL JGT-4   |
| CYLINDERS        | (2) 14-1/8" T CYL. (14.125" BORE)<br>(1) 11" T CYL. (11.000" BORE)<br>(1) 7-1/4" T CYL. (6.750" BORE) |
| DRIVER           | CATERPILLAR, MODEL G3516J-LE  |
| COUPLING         | TB WOODS, FSH-70  |
| COOLER           | AIR-X-CHANGERS 156-EH   |
| PANEL            | EMIT  |
| MAJOR COMPONENTS |   |

PLAN  
SCALE 1/2" = 1'-0"

| UNIT DIMENSIONS |             |
|-----------------|-------------|
| OVERALL LENGTH  | 40'-2 1/8"  |
| OVERALL WIDTH   | 26'-7 7/8"  |
| OVERALL HEIGHT  | 24'-9 9/16" |
| SHIPPING LENGTH | 39'-2"      |
| SHIPPING WIDTH  | 15'-8 1/16" |
| SHIPPING HEIGHT | 11'-2 5/8"  |


| UNIT WEIGHTS                |          |
|-----------------------------|----------|
| MAIN SKID FOUNDATION WEIGHT | 150,262# |
| MAIN SKID SHIPPING WEIGHT   | 120,614# |
| DRIVER WEIGHT               | 17,400#  |
| COOLER WEIGHT W/PIPE        | 31,010#  |

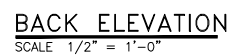
|     |                                |         |    |     |  |                          |        |    |       |          |       |          |
|-----|--------------------------------|---------|----|-----|--|--------------------------|--------|----|-------|----------|-------|----------|
|     |                                |         |    |     |   |                          |        |    |       |          |       |          |
|     |                                |         |    |     | THIS DRAWING IS THE PROPERTY OF ALEGACY EQUIPMENT<br>AND IS NOT TO BE USED FOR ANY PURPOSE OTHER THAN THAT FOR<br>WHICH IT IS SPECIFICALLY FURNISHED |                          |        |    |       |          |       |          |
|     |                                |         |    |     | CUSTOMER<br>KODIAK GAS SERVICES  |                          |        |    |       |          |       |          |
|     |                                |         |    |     | TITLE<br>GENERAL ARRANGEMENT<br>CAT G3516J-LE, ARIEL JGT-4/3 STAGE   |                          |        |    |       |          |       |          |
| 3   | AS-BUILT                       | 1/9/19  | GG | KM  | DATE   | 03/04/14                 | CHK BY | BD | DATE  | 03/04/14 | SCALE | AS NOTED |
| 2   | REVISED DIMENSION & PANEL INFO | 10/2/18 | JR | HV  | DATE   |                          | CHK BY |    | DATE  |          |       |          |
| 1   | REMOVED SUCTION VENT LINE      | 9/25/18 | GG | HV  | DATE   |                          | CHK BY |    | DATE  |          |       |          |
| 0   | ISSUED FOR CONSTRUCTION        | 8/6/18  | CC | SS  | DATE   |                          | CHK BY |    | DATE  |          |       |          |
| REV | DESCRIPTION                    | DATE    | BY | CHK | DATE   | A-1677-201-01 SHT 1 OF 8 |        |    | REV 3 |          |       |          |




FRONT ELEVATION  
SCALE 1/2" = 1'-0"

|               |  |
|---------------|--|
| ALEGACY JOB # |  |
| 1677-1704     |  |
|               |  |

|     |                           |         |    |     |  |          |      |          |       |          |
|-----|---------------------------|---------|----|-----|--|----------|------|----------|-------|----------|
|     |                           |         |    |     |   |          |      |          |       |          |
|     |                           |         |    |     | THIS DRAWING IS THE PROPERTY OF ALEGACY EQUIPMENT<br>AND IS NOT TO BE USED FOR ANY PURPOSE OTHER THAN THAT FOR<br>WHICH IT IS SPECIFICALLY FURNISHED |          |      |          |       |          |
|     |                           |         |    |     | CUSTOMER<br>KODIAK GAS SERVICES  |          |      |          |       |          |
|     |                           |         |    |     | TITLE<br>GENERAL ARRANGEMENT<br>CAT G3516J-LE,ARIEL JGT-4/3 STAGE  |          |      |          |       |          |
| 3   | AS-BUILT                  | 1/9/19  | GG | KM  | DATE   | 03/04/14 | DATE | 03/04/14 | SCALE | AS NOTED |
| 2   | UPDATED VIEW              | 10/2/18 | JR | HV  | DATE   | 03/04/14 | DATE | 03/04/14 | SCALE | AS NOTED |
| 1   | REMOVED SUCTION VENT LINE | 9/25/18 | GG | HV  | DATE   | 03/04/14 | DATE | 03/04/14 | SCALE | AS NOTED |
| 0   | ISSUED FOR CONSTRUCTION   | 8/6/18  | GG | SS  | DATE   | 03/04/14 | DATE | 03/04/14 | SCALE | AS NOTED |
| REV | DESCRIPTION               | DATE    | BY | CHK | A-1677-201-02 SHT 2 OF 8   |          |      |          |       |          |
|     |                           |         |    |     | REV 3  |          |      |          |       |          |



|     |                           |         |    |     |  |          |
|-----|---------------------------|---------|----|-----|--|----------|
|     |                           |         |    |     |   |          |
|     |                           |         |    |     | THIS DRAWING IS THE PROPERTY OF ALEGACY EQUIPMENT<br>AND IS NOT TO BE USED FOR ANY PURPOSE OTHER THAN THAT FOR<br>WHICH IT IS SPECIFICALLY FURNISHED |          |
|     |                           |         |    |     | CUSTOMER <b>KODIAK GAS SERVICES</b>  |          |
|     |                           |         |    |     | TITLE <b>GENERAL ARRANGEMENT</b><br><b>CAT G3516J-LE, ARIEL JGT-4/3 STAGE</b>  |          |
| 3   | AS-BUILT                  | 1/9/19  | GG | KM  | DATE   | SCALE    |
| 2   | UPDATED VIEW              | 10/2/18 | JR | HV  | 03/04/14   | AS NOTED |
| 1   | REMOVED SUCTION VENT LINE | 9/25/18 | GG | HV  | 03/04/14   |          |
| 0   | ISSUED FOR CONSTRUCTION   | 8/6/18  | GG | SS  |  |          |
| REV | DESCRIPTION               | DATE    | BY | CHK | DATE   | SCALE    |
|     |                           |         |    |     | 03/04/14   | AS NOTED |
|     |                           |         |    |     | A-1677-201-03 SHT 3 OF 8   |          |
|     |                           |         |    |     | REV 3  |          |



## Section 22: Certification

Company Name: Targa Northern Delaware, LLC

I, Jimmy E Oxford, hereby certify that the information and data submitted in this application are true and as accurate as possible, to the best of my knowledge and professional expertise and experience.

Signed this 7<sup>th</sup> day of March, 2023 upon my oath or affirmation, before a notary of the State of

Texas

\*Signature

[Signature]

Date

3/7/23

Printed Name

Jimmy E Oxford

Title

VP operations

Scribed and sworn before me on this 7<sup>th</sup> day of March, 2023.

My authorization as a notary of the State of TEXAS expires on the

1<sup>st</sup> day of October, 2024.

Notary's Signature

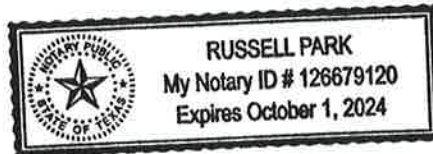
[Signature]

Date

3/7/23

Notary's Printed Name

Russell Park



\*For Title V applications, the signature must be of the Responsible Official as defined in 20.2.70.7.AE NMAC.