



**MAQS**

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September 11, 2017

006AS-237228

Mr. Michael Eisele, P.E.  
Oregon Department of Environmental Quality  
Western Region – Salem Office  
4026 Fairview Industrial Drive  
Salem, OR 97302

Re: Source Testing: American Petroleum Environmental Services  
11535 N Force Ave  
Portland, OR 97217

This correspondence is notice that Montrose Air Quality Services, LLC, an affiliate of Montrose Environmental Group, Inc. (MAQS), is to do source testing for the above-referenced facility, scheduled for September 28, 2017. This will serve as the Source Test Plan unless changes are requested prior to the start of testing.

1. **Sources to be Tested:** Thermal Oxidizer 1 and Oil Heater #3
2. **Test Locations:** Thermal Oxidizer inlet, Thermal Oxidizer outlet, refinery effluent piping at the inlet of Oil Heater #3.
3. **Purpose of the Testing:** To determine compliance with the VOC destruction efficiency and emission factor verification of the Oregon Department of Environmental Quality (ODEQ) Mutual Agreement and Final Order (MAO) No. AQ/AC-NWR-2016-217.
4. **Source Description:** The effluent at the facility is generated from a used oil refining process. A flash tank (water/#2 distillate boiled off), and two Wiped Film Evaporators (WFE) are operated under vacuum. The discharge from the vacuum system is sent through Oil Heater #3 for combustion. The outlet of Oil Heater #3 is directly piped to the inlet of the Regenerative Thermal Oxidizer. Fresh air is drawn in through the suction side of the RTO process fan to cool the burner effluent and protect the process fan.
5. **Pollutants to be Tested:** CO, NO<sub>x</sub>, SO<sub>2</sub>, VOC, and opacity.
6. **Test Methods to be Used:** Testing will be conducted in accordance with EPA methods in Title 40 Code of Federal Regulations Part 60 (40 CFR 60), Appendix A, July 1, 2017; Oregon Department of Environmental Quality (ODEQ) methods in Source Sampling Manual Volume 1, March, 2015.



#### Thermal Oxidizer Inlet

Flow Rate:	EPA Methods 1 and 2 (S- or p-type pitot flow traverses)
CO <sub>2</sub> and O <sub>2</sub> :	EPA Method 3/3A (Integrated Tedlar bags with NDIR and paramagnetic analyzers)
Moisture:	EPA Method 4 (impinger train technique)
VOC (TGOC):	VOC as total gaseous organic compounds (TGOC) by EPA Method 25A (heated flame ionization analyzer and sample line)

#### Thermal Oxidizer Outlet

Flow Rate:	EPA Methods 1 and 2 (S- or p-type pitot flow traverses)
CO <sub>2</sub> and O <sub>2</sub> :	EPA Method 3A (NDIR and paramagnetic analyzers)
Moisture:	EPA Method 4 (impinger train technique)
SO <sub>2</sub> :	EPA Method 6C (non-dispersive ultraviolet analyzer)
NO <sub>x</sub> :	EPA Method 7E (chemiluminescent analyzer)
Opacity:	EPA Method 9 (six minutes per test run)
CO:	EPA Method 10 (gas filter correlation analyzer)
VOC (TGOC):	VOC as total gaseous organic compounds (TGOC) by EPA Method 25A (heated flame ionization analyzer and sample line)

#### Oil Heater #3 Inlet

Flow Rate:	EPA Methods 1A & 2C (p-type pitot traverse of duct <12") or EPA Method 2A (In-line flow meter)
CO <sub>2</sub> and O <sub>2</sub> :	EPA Method 3/3A (Tedlar bags with NDIR and paramagnetic analyzers)
Moisture:	ODEQ Method 4 (wet /dry bulb temperatures)
VOC (TGOC):	VOC as total gaseous organic compounds (TGOC) by EPA Method 25A (heated flame ionization analyzer and sample line)

7. **Continuous Analyzer Data Recording:** Data acquisition system (DAS) will be used. Strip chart records may be used as backup. One-minute averages of one-second readings are logged. Run averages, tabulated data and the graphic outputs from the DAS are included in the test reports.
8. **Continuous Analyzer Gas Sampling:** One, three, or twelve points will be sampled for EPA Methods 3A, 6C, 7E, & 10. The number and location of the sample points will be based on a stratification check done according to EPA Method 7E. EPA Method 25A will be sampled from a single opening probe so that the gas sample is collected from the centrally located 10 percent area of the stack cross-section.
9. **Integrated Bag Gas Sampling:** EPA Method 3/3A will be sampled with the EPA Method 4 probe. Tedlar bags will be filled off the exhaust of the sampling train.
10. **Criteria Location:** It is assumed today, but it will be confirmed on or before the test day, that each test port location meets criteria in EPA Methods 1 and 2.
11. **Quality Assurance/Quality Control (QA/QC):** Method-specific quality assurance/quality control procedures must be performed to ensure that the data is valid for determining source compliance. Documentation of the procedures and results will be presented in the source test report for review. Omission of this critical information may result in rejection of the data, requiring a retest. This documentation will include at least the following:



Continuous analyzer procedures: Field crews will operate the analyzers according to the test method requirements with additional data backup. On-site procedures include:

EPA Methods 3A, 6C, 7E, 10, 25A:

- Analyzer calibration error before initial run and after a failed system bias or drift test (within  $\pm 2.0\%$  of the calibration span of the analyzer for the low, mid, and high-level gases or 0.5 ppmv absolute difference)
- System bias at low-scale (zero) and upscale calibration gases (within  $\pm 5.0\%$  of the calibration span or 0.5 ppmv absolute difference, except EPA Method 25A, which allows  $\pm 5.0\%$  of the range used)
- Drift check (within  $\pm 3.0\%$  of calibration span for low, and mid or high-level gases, or 0.5 ppmv absolute difference)
- System response time (during initial sampling system bias test)
- Checks performed with EPA Protocol 1 or NIST traceable gases except zero gas
- Zero gas meets the definition for zero air material as defined by 40 CFR 72.2
- Leak free sampling system
- Data acquisition systems record 10-second data points or one-minute averages of one second readings
- NO<sub>2</sub> to NO conversion efficiency test will be provided in report
- Purge time ( $\geq 2$  times system response time and will be done before starting run 1, whenever the gas probe is removed and re-inserted into the stack, and after bias checks)
- Sample time (at least two times the system response time at each sample point)
- Sample flow rate (within approximately 10% of the flow rate established during system response time check)
- Interference checks for analyzers used will be included in the final test report
- Average concentration (run average  $\leq$  calibration span for each run)
- Stratification test (to be done during run 1 at three(3) or twelve(12) points according to EPA Method 7E; EPA Method 3A if done for molecular weight only will be sampled near the centroid of the exhaust; and stratification check not normally applicable for RATAs)

Tedlar bags:

- Daily calibration (zero and span) and calibration error (linearity) checks
- Tedlar bags will be analyzed after daily calibration and calibration error checks
- Checks performed with EPA Protocol 1 gases

Manual equipment procedures: Field crews will operate the manual testing equipment according to the test method requirements. On-site procedures include:

- Operators will perform pre- and post-test leak checks on the sampling system and pitot lines.
- Thermocouples attached to the pitots and probes are calibrated in the field using EPA Alternate Method 11. A single-point calibration on each thermocouple system using a reference thermometer is performed. Thermocouples must agree within  $\pm 2^\circ\text{F}$  with the reference thermometer. Also, prior to use, thermocouple systems are checked for ambient temperature before heaters are started.
- Pitots are examined before and after each use to confirm that they are still aligned.
- Pre- and post-test calibrations on the meter boxes will be included with the report, along with semi-annual calibrations of critical orifices, and thermocouples (sample box impinger outlet and oven, meter box inlet and outlet, and thermocouple indicators).



Audit Sample Requirement: The EPA Stationary Source Audit Sample Program was restructured and promulgated on September 30, 2010 and was made effective 30 days after that date. The Standard requires that the Facility or their representative must order audit samples if they are available, with the exception of the methods listed in 40 CFR 60, 60.8(g)(1). The TNI website is referred to for a list of available accredited audit Providers and audits ([www.nelac-institute.org/ssas/](http://www.nelac-institute.org/ssas/)). If samples are not available from at least two accredited Providers they are not required. Currently, accredited Providers offer audit samples for EPA Methods 6, 7, 8, 12, 13A, 13B, 26, 26A, 29 and 101A. Based on the above, American Petroleum Environmental Services is not required to obtain audit samples for this test program.

12. **Number of Sampling Replicates and their Duration:** Three (3) test runs of at least 60 minutes each, except where otherwise noted for opacity. In no case will sampling replicates be separated by twenty-four (24) or more hours, unless prior authorization is granted by the Department.
13. **Reporting Units for Results:** Results will be expressed as concentrations (ppmv), as rates (lb/hr), and on a production basis (lb/10<sup>3</sup> gallon of oil refined).
14. **Emission Factors or Limits:**

Pollutant	Plant	EF			Operating Factor		PTE	
	Source	Value	Units	Source	Value	Units	TPY	Facility Total TPY
CO	TO-01	0	lbs/10 <sup>6</sup> SCF	AP-42	0.64	10 <sup>6</sup> SCF Per Year	0.000	1.44
NO <sub>x</sub>	TO-01	2.2	lbs/10 <sup>6</sup> SCF	AP-42	0.64	10 <sup>6</sup> SCF Per Year	0.000	4.88
SO <sub>2</sub>	TO-01	0.6	lbs/10 <sup>6</sup> SCF	AP-42	0.64	10 <sup>6</sup> SCF Per Year	0.00	37.58
VOC*	HTR-3	1	lbs/10 <sup>3</sup> gallons	AP-42	324.94	10 <sup>3</sup> Gallons Per Year	0.162	6.608
	TO-01	5.5	lbs/10 <sup>6</sup> SCF	AP-42	0.64	10 <sup>6</sup> SCF Per Year	0.002	

VOC: 97% destruction efficiency

15. **Montrose Air Quality:** Chris Hinson or Thomas Rhodes  
 Cell (971) 295-1200  
 Office (503) 255-5050  
 E-mail [chinson@montrose-env.com](mailto:chinson@montrose-env.com)  
[trhodes@montrose-env.com](mailto:trhodes@montrose-env.com)
16. **Source Site Personnel:** Colin Gregg – EcoLube Recovery  
 (425) 599-9035  
 E-mail [colin.gregg@ecoluberecovery.com](mailto:colin.gregg@ecoluberecovery.com)



17. **Regulatory Contact:** Michael Eisele  
(503) 378-5070  
Fax (503) 378-4196  
E-mail [EISELE.Michael@deq.state.or.us](mailto:EISELE.Michael@deq.state.or.us)

Louis Bivins  
[Bivins.louis@deq.state.or.us](mailto:Bivins.louis@deq.state.or.us)

18. **Applicable Process/Production/Control Information:** Operating data that characterize the source are considered to be:

- Quantity of natural gas combusted in the oxidizer.
- Quantity of oil refined in the PESCO refinery.
- Production rate/throughput metrics of Oil Heater #3
- Operating temperature in the combustion chamber of the oxidizer.
- All normally recorded process information

**Process/Production/Control information is to be gathered for each test run by the Source Site Personnel and provided to MAQS for inclusion in the report.**

Testing must be performed at process operating rates approximating the Facility's normal maximum operating capacity.

19. **Opacity Readings to be Taken By Certified Observer From:** MAQS

Visible emissions will be determined using EPA Method 9 within 30 minutes before, during, or within 30 minutes after each test run, unless weather conditions are such that visible emissions cannot be read.

20. **Source Test Audit Report:** Source Test Audit Report forms will be submitted along with the source test report for this testing.

21. **Plant Entry & Safety Requirements:** The test team will follow internal safety policies and abide by any site specific safety and entry requirements.

22. **Responsibilities of Test Personnel:** The test team will consist of one Project Manager and two Technicians. The Project Manager is responsible for overseeing sample and data collection, while the Technician works at the sample location. It is anticipated that Chris Hinson, QSTI (1-4) will be the Project Manager with Paul Berce and Claire Sutton the Technicians.

At least one team member will hold current QSTI and/or QI certifications for all test methods included in this test program.

23. **Tentative Test Schedule:**

Sept 27: Mobilize and setup  
Sept 28: Test and demobilize



24. **Other Considerations:** None known

25. **Administrative Notes:** Unless notified prior to the start of testing, this test plan is considered to be approved for compliance testing of this source. A letter acknowledging receipt of this plan and agreement on the content (or changes as necessary) would be appreciated.

The Department will be notified of any changes in source test plans prior to testing. It is recognized that significant changes not acknowledged, which could affect accuracy and reliability of the results, could result in test report rejection.

Source test reports will be prepared by MAQS and will include all results and example calculations, field sampling and data reduction procedures, laboratory analysis reports, and QA/QC documentation. Source test reports will be submitted to you within 45 days of the completion of the field work, unless another deadline is agreed upon. American Petroleum Environmental Services should send one (1) hardcopy of the completed source test report to you at the address above.

Any questions or comments relating to this test plan should be directed to me.

Sincerely,

A handwritten signature in black ink, appearing to read "TR", is written over a horizontal line.

Thomas Rhodes  
Client Project Manager  
Montrose Air Quality Services, LLC

For information on MAQS and Montrose Environmental, go to [www.montrose-env.com](http://www.montrose-env.com)

cc: Colin Gregg, EcoLube Recovery

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# Oregon

Kate Brown, Governor

## Department of Environmental Quality

Northwest Region  
700 NE Multnomah Street, Suite 600  
Portland, OR 97232  
(503) 229-5263  
FAX (503) 229-6945  
TTY 711

September 21, 2017

Colin Gregg  
American Petroleum  
11535 N Force Ave  
Portland, OR 97217

Thomas Rhodes  
Montrose Air Quality Services  
13585 NE Whitaker Way  
Portland, OR 97230

Re: American Petroleum  
Permit number 26-3021-ST-01  
Source Test Plan

Colin Gregg and Thomas Rhodes:

The source test plan received on September 11, 2017 for source testing at the American Petroleum facility located in Portland, OR has been reviewed. DEQ understands that testing will be conducted at the inlet to and the exit of Thermal Oxidizer No. 1. Testing will also be at the inlet to Oil Heater No. 3. Testing will be for visual emissions (Opacity), carbon monoxide (CO), oxides of Nitrogen (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), and volatile organic compounds (VOCs). The testing will be simultaneous for all three testing locations and will be used to determine compliance, to determine the VOC destruction efficiency of thermal oxidizer, and to verify emission factors for the emission unit. The source test plan is approved with the following conditions:

### GENERAL PROCESS CONDITIONS

- 1.) Only regular operating staff may adjust the production process and emission control parameters during the source performance tests and within two (2) hours prior to the tests. Any operating adjustments made during the source performance tests, which are a result of consultation during the tests with source testing personnel, equipment vendors or consultants, may render the source performance test invalid.
- 2.) Sampling replicate(s) will not be accepted if separated by duration of twenty-four (24) hours or more, unless prior authorization is granted by DEQ.
- 3.) DEQ must be notified of any changes in the source test plan and/or the specified methods prior to testing. Significant changes not acknowledged by the DEQ could be the basis for invalidating a test run and potentially the entire testing program. Documentation of any deviations must include an evaluation of the impact of the deviation on the test data.
- 4.) Method-specific quality assurance/quality control (QA/QC) procedures must be performed to ensure that the data is valid for determining source compliance. Documentation of the procedures and results shall be presented in the source test report for review. Omission of this critical information will result in rejection of the data, requiring a retest.
- 5.) It is acceptable to postpone a scheduled test or suspend a test in progress if the discontinuation is due to equipment failure beyond the facility's control, construction delays beyond the facility's control, severe meteorological conditions, and situations that would jeopardize the safety of the testing contractors and/or operators. If the test is underway, the permittee should make every effort to complete the test run. All recoverable test information (process & sample data) must be available for DEQ review.

It is unacceptable to postpone or suspend a test run in progress if it is discontinued because the source is not able to comply with an emission limit or verify an emission factor. The permittee must provide DEQ written documentation explaining the reasons for the postponement or stoppage, and any data collected prior to the stoppage.

- 6.) During the source test, stack exhaust gas must be sampled while the facility is operating at 90 to 110% of its maximum normal operating capacity. The oil being processed and burned must be representative of normal operations.
- 7.) During compliance source testing the following process parameters must be monitored and recorded. All process parameters are to be reported for each individual test run and averaged for all test runs if appropriate.
  - Natural gas usage rate (scfh)
  - Amount of oil refined (gallons)
  - Specifications of the oil being processed
  - Specifications of the oil being produced
  - Process operation parameters for each system
  - Operating temperature of the oxidizer (°F)
  - Type and quantity of fuel burned at Oil Heater No. 3
  - Content of arsenic, cadmium, chromium, lead, halogens, and PCB in the fuel for Oil Heater No. 3
  - Flash point of the fuel for Oil Heater No. 3

#### **EPA METHODS 1-4 CONDITIONS**

- 8.) The sample locations must meet the EPA Methods 1/1A & 2 criteria. Documentation including clear diagrams must be provided in the source test report.
- 9.) Flow sampling locations smaller than 4 inches may use EPA Method 2A or EPA Method 2D. Other methods may be used if approved by DEQ before the start of the test.
- 10.) Cyclonic flow shall be checked prior to testing.
- 11.) Each Method 3A sampling system must be leak-checked before and after the testing program (before the first run and after the last run). Results of the leak check are to be documented within the test report. Tedlar bag samples are approved for the inlet testing locations.
- 12.) Make sure the sample volume for EPA Method 4 is at least 21 dscf.

#### **EPA METHOD 6C CONDITIONS**

- 13.) Each Method 6C sampling system must be leak-checked before and after the testing program (before the first run and after the last run). Results of the leak check are to be documented within the test report.
- 14.) SO<sub>2</sub> emissions must be reported as indicated below for each individual test run and averaged for all three test runs. Hand calculations must be provided for at least one test run.
  - ppmvd
  - lbs/hour
  - lbs/1000 gallons of oil processed
  - lbs/1000 gallons of oil burned in Heater No. 3

#### **EPA METHOD 7E CONDITIONS**

- 15.) The converter efficiency of the NO<sub>x</sub> analyzer must be documented within the test report.
- 16.) Each Method 7E sampling system must be leak-checked before and after the testing program (before the first run and after the last run). Results of the leak check are to be documented within the test report.



- 17.) NO<sub>x</sub> emissions as NO<sub>2</sub> must be reported as indicated below for each individual test run and averaged for all three test runs. Hand calculations must be provided for at least one test run.
- ppmvd
  - lbs/hour
  - lbs/1000 gallons of oil processed
  - lbs/1000 gallons of oil burned in Heater No. 3

#### **EPA METHOD 9 CONDITIONS**

- 18.) Opacity must be monitored during or within 30 minutes of each test run, as measured by EPA Method 9.

#### **EPA METHOD 10 CONDITIONS**

- 19.) Each Method 10 sampling system must be leak-checked before and after the testing program (before the first run and after the last run). Results of the leak check are to be documented within the test report.
- 20.) CO emissions must be reported as indicated below for each individual test run and averaged for all three test runs. Hand calculations must be provided for at least one test run.
- ppmvd
  - lbs/hour
  - lbs/1000 gallons of oil processed
  - lbs/1000 gallons of oil burned in Heater No. 3

#### **EPA METHOD 25A CONDITIONS**

- 21.) Each Method 25A sampling system must be leak-checked before and after the testing program (before the first run and after the last run). The results of the leak check must be reported in the test report.
- 22.) Although not in the test plan. When talking to Thomas Rhodes he indicated that EPA Method 18 via Tedlar bags would be utilized to subtract methane and/or ethane emissions from the total VOCs measured by EPA Method 25A. This is approved if the sample is collected, at a constant rate, in a Tedlar bag over the duration of the test run. Immediately after the completion of the test run the bag's valve must be closed and the pressure inside the bag must be kept positive until the sample is analyzed to assure any leakage in the bag will not dilute the sample. A rubber band around the bag should be sufficient to accomplish this although other measures may be taken that accomplish the same result.
- 23.) The span of the analyzer used to perform EPA Method 25A should be equivalent to 1.5 to 2.5 times the expected concentration.
- 24.) The calibration gases shall be the following percent of the instrument's span.
- zero < 0.1%
  - low level = 25-35%
  - mid level = 45-55%
  - high level = 80-90%
- 25.) VOC emissions must be reported as indicated below for each individual test run and averaged for all three test runs on a propane basis. Hand calculations must be provided for at least one test run.
- ppmvd
  - lbs/hour
  - lbs/1000 gallons of oil processed
  - lbs/1000 gallons of oil burned in Heater No. 3
  - % destruction removal efficiency

## **GENERAL REPORTING CONDITIONS**

- 26.) A copy of a completed Source Test Audit Report (STAR) for all applicable methods performed must accompany the submittal of the Source Test Report. A copy of the STAR forms is available electronically from the regional source test coordinator.
- 27.) In an attempt to conserve natural resources and to minimize storage space requirements, the test report should be printed on both sides of each page within the document. DEQ recognizes this may not be feasible for some supporting documentation (i.e. figures, maps, etc.).

DEQ understands that the source test has been scheduled for September 28, 2017. If you have any questions or concerns, please contact me at (503) 378-5070.

Sincerely,

Mike Eisele, PE  
Environmental Engineer 3  
Western Region-Salem Office

cc: Dave Kauth, DEQ: AQ-NWR (Portland)