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June 27, 2016 (Revised June 29, 2016)

Mr. Nathan Hude
Environmental Quality Analyst
Air Quality Division
Michigan Department of Environmental Quality
Constitution Hall
525 West Allegan Street
P.O. Box 30242
Lansing, MI 48909-7742

RE: RESPONSE OF RJ INDUSTRIAL RECYCLING, INC. TO MAY 25, 2016 VIOLATION NOTICE LETTER SRN: N7885, GENESEE COUNTY

Dear Mr. Hude:

RJ Industrial Recycling, Inc. ("RJI") is in receipt of your May 25, 2016 letter identifying alleged air pollution violations as a result of Visible Emissions readings taken May 24, 2016 by MDEQ in the vicinity of RJI's business location at **G5167** North Dort Highway, Flint Michigan. RJI appreciates MDEQ's commitment to addressing air emission issues, and bringing its concerns to RJI's attention. RJI is similarly committed to addressing air emission issues, and appreciates the opportunity of working with MDEQ in seeking to rectify air emission problems.

You have asked that RJI initiate actions to address the alleged violations, and in its response to the Violation Notice, identify the dates of the alleged violations; provide an explanation of causes and durations of the alleged violations; whether the alleged violations are ongoing; summarize the actions taken and which are proposed to be taken to correct the alleged violations; the dates by which these actions will take place, and to identify the steps being taken to prevent recurrence of the alleged violations.

SUMMARY RESPONSE

As you know, RJI has made a substantial investment over a number of years in the development of air emission control technology, "SPARCS", which USEPA has endorsed, and which RJI utilizes in appropriate circumstances and conditions to reduce or eliminate VEs in connection with torch cutting of certain materials and objects. Unfortunately, on May 24, 2016 the date upon which you visited the Dort Highway business location, the SPARCS unit was inoperable due to need for mechanical repairs arising

as a result of fan blade damage occurring during the prior week. RJI's SPARCS unit was unavailable due to these mechanical issues while awaiting replacement parts. (Ex. 1)

However, although unavailable for use, steps were immediately taken to control emissions from torching operations at RJI's Dort Highway location, including use of its torch cutting Best Management Practices ("BMPs") which have also been endorsed by EPA as being effective in proactively limiting VEs. These BMPs have been incorporated in its company policies. Additionally, arrangements were made for delivery of a Buffalo Turbine from Woodhaven Michigan, to assist in controlling torch cutting emissions, which arrived on May 26, and was installed for use commencing May 27, 2016. (Ex. 2)

You should also be advised that RJI has implemented a rigorous training program which it has documented and submitted to EPA on a regular ongoing basis.

Finally, in an effort to proactively work with MDEQ in connection with air emission issues, RJI has spoken to and is making arrangements with Eastern Technical Associates ("ETA"), the North Carolina third-party trainer of certified VE-9 Observers, to visit RJI's business location at **G5167** North Dort Highway, Flint Michigan to conduct observations and site specific assessment of the VE sources at the RJI Flint, location. This effort will help identify the sources and establish sound guidelines and training for performing visible emission observations on them. RJI invites you and MDEQ representatives from the AQD to attend this session, so that cooperatively RJI and MDEQ, with ETA's assistance, can arrive at methods to avoid visible readings of comingled emissions in recognition of the fact that the torch cutting operations at RJI involve multiple, mobile, non-stationary sources. ETA is unavailable to conduct these activities at RJI's business location, until early August. RJI trusts that MDEQ will cooperatively undertake this opportunity.

Introduction

After MDEQ issued its Violation Notice letter RJI submitted a Freedom of Information Act (FOIA) request to MDEQ to assist it in evaluating the information upon which MDEQ relied in issuing its violation notice. In addition the FOIA request sought copies of all records of DEQ AQD relating to site visits May 17-19 and 24, 2016, including but not limited to visible emissions (VE) readings, photos, notes and other records; and records relating to SRN: N7885, Genesee County, Violation Notice May 25, 2016, and a copy of Method VE-9 manual/guidance utilized by AQD.

Based upon a review of the documents produced pursuant to FOIA, it appears that MDEQ's VE-9 (Method 9) guidance is Appendix A-4 to 40 CFR sec 60 entitled METHOD 9-VISUAL DETERMINATION OF THE OPACITY OF EMISSIONS FROM STATIONARY SOURCES (attached as **Ex 3**). On its face, Method 9 appears to relate to "stationary sources", which are defined by 40 CFR sec 60.2 as:

> Stationary Source means any building, structure, facility, or installation which emits or may emit any air pollutant."

Cutting torches are mobile pieces of equipment and not stationary sources. Nonetheless, if regulated under VE-9, RJI has questions concerning the methodology utilized in performing the observations, and has agreed to bring Eastern Technical Associates, to its Flint business location to enable cooperative efforts by RJI and MDEQ, with ETA's assistance, to arrive at methods to avoid visible readings of comingled emissions, in recognition of the fact that the torch cutting operations at RJI involve multiple, mobile, non-stationary sources. RJI hopes that MDEQ will accept its invitation to do so.

RJI is optimistic that upon review of RJI's responses, MDEQ will reconsider the Violation Notice, or otherwise determine that RJI has complied with the requirements of Rule 301 as well as the ACO.

The following is RJI's response to each of the Rule/Permit Conditions for which MDEQ issued its Violation Notice letter of May 25, 2016.

A. Cited Alleged Violation of Rule 301

(1) Rule 301-Smoke from Torch Cutting Operations Exceeded 51%

The May 25, 2016 letter pertaining to the May 24, 2016 site visit comments that "during the visible emissions readings, the maximum six minute opacity reading was 51.0%" RJI submits that opacity readings are extremely subjective but notes that the documents furnished do not appear to specify the source of the visible emissions allegedly exceeding the parameters of Rule 301. Based upon the narrative and the reports produced by MDEQ pursuant to the Freedom of Information Act, there is no reference to the multiple torch-cutting sources at the facility on May 24, 2016, or an attempt to distinguish between or otherwise avoid comingling of emissions or plumes when making readings.

Proper measurement of opacity according to the rules requires a reading of the individual source of the opacity. According to RJI's records, on May 24, 2016 there were no less than five different torch cutting sources, none of which appears to have been identified as the source of the opacity readings. Notwithstanding this fact, RJI has undertaken to minimize its emissions, and is re-examining the procedures employed, including possible more frequent use of SPARCS at its facility, which was unfortunately out of service due to fan blade damage occurring days before the site visit.

Given that it does not appear that the opacity readings upon which this alleged violation was based identify the actual source of the emission, RJI believes that the opacity readings used to support the violation are invalid. According to the Violation Notice letter of May 25, 2016, the observations upon which the violation notice was based took place on May 24, 2016. On that date, RJI's records indicate that there were five Torchmen using separate torches at the Dort Highway business property, at different locations on the property.

Not unlike a factory with separate stacks, the guidance documents referred to by MDEQ [MDEQ's VE-9 (Method 9) guidance is Appendix A-4 to 40 CFR sec 60 entitled METHOD 9-VISUAL DETERMINATION OF THE OPACITY OF EMISSIONS FROM STATIONARY SOURCES (attached as Ex 3)] requires that the actual source of a plume be identified, isolated and examined to determine if there is an exceedance from a particular source, after meeting all of the other visual requirements under the VE9 protocols. These protocols specifically require a line of site to the source of the plume, and strict avoidance of comingling of emissions and plumes.

The records produced in conjunction with the VE9 readings taken by MDEQ do not identify the source of the emission, and specifically indicate that the observation was made "over a fence line", indicating no eye contact or line of site to the alleged source of the plume. Thus, there is no way to confirm the accuracy of the opacity readings, where there were five separate Torchmen operating. Accordingly, RJI respectfully requests that MDEQ dismiss the alleged violation of Rule 301, and participate in the ETA evaluation.

B. Cited Alleged Violations of EPA Administrative Consent Order (ACO):

(1) **ACO Paragraph 23**: Paragraph 23 of the ACO requires that RJ Torching develop a training program on all aspects of the Best Management Practices for Torch Cutting Operations, and that its employees who conduct torch cutting, and appropriate supervisors and managers, complete the training. In addition, refresher training is required at least annually, and RJT is required to document completion of the training for each such employee by date and signature.

Response:

RJ Torching, as a member of the Responsible Recyclers Association, helped craft the torch cutting Best Management Practices ("BMPs") which were supplied to USEPA and incorporated in Appendix A. These BMPs are routinely followed by RJI and its employees. RJT provided a copy of the Best Management Practices document to USEPA because they were then presently being utilized by RJT prior to the time the ACO was entered into. The BMPs had been incorporated into and were the basis for the training program referred to in ACO Paragraph 23. The training program is in place and RJI's requisite employees undertake annual training, as documented in the sign-in sheets for such training which have been submitted to EPA. Accordingly, RJI submits that the alleged violation of ACO Paragraph 23 be reconsidered and removed from the Violation Notice.

Since entry of the ACO, RJ Torching has implemented daily documentation of not only the implementation of the training, but verification that the requisite Torchmen have completed the training. ("EPA ACO Compliance Worksheets" submitted to EPA provide dated information concerning torch cutting activities which may take place on that date;

documented adherence to the BMPs; confirmation of current training of each Torchman; and confirmation of daily weather readings affecting torch cutting operations).

For the further reasons set forth in its response to the alleged violation of Rule 301 (above), RJI respectfully requests that MDEQ dismiss its violation notice based upon the alleged violation of ACO Paragraph 23, since this alleged violation is dependent upon a Rule 301 violation.

(2) ACO Appendix A, Paragraph 8: Paragraph 8 states that R J Torching shall ensure that its employees are aware of what materials are likely to produce higher VEs when torch cut and shall develop protocols to manage VEs when cutting those materials.

Response:

R J Torching trains its employees who are engaged in torch cutting to recognize potentially high VE materials and how to manage reduce or eliminate VE's. Each day, a specially designed worksheet (EPA ACO Compliance Worksheet ["worksheet"]) developed by R J Torching to help it document its compliance with and meet the goals of the ACO, is prepared at the beginning of the work day.

First, RJT documents whether torch cutting operations will be performed that day. If so, an additional eleven factual determinations must be made and recorded on the worksheet:

> (1) is the site map posted; (2) has the daily weather report been obtained and reviewed (for weather conditions that might affect torch-cutting operations); (3) confirm whether each of the Torchmen are current in their VE reduction protocol and work procedures (including BMPs) training; (4) determine whether a shear can be utilized in lieu of or to reduce torching; (5) determine whether SPARCS Unit is required; (6) confirm that preventive maintenance has been completed on all torch equipment that day; (7) confirm that housekeeping in the area of torch cutting has been completed; (8) confirm that fire prevention equipment is in place; (9) confirm that all fluids and non-metals have been drained or removed from metal objects to be torched; (10) confirm and record the opacity level from SPARCS exhaust (if SPARCS is used); and (11) verify that the horn is in place at the torching area.

Based upon R J Torching's experience working with various metals, and consistent with its BMPs and company policies, it considers the metallurgical properties and size of metal objects before torch-cutting, employing mechanical means such as shears where possible to avoid torch cutting. Consistent with its BMPs, RJT also removes extraneous/combustible objects (where practicable) and drains all known fluids where possible before torch cutting objects.

In addition, R J Torching has discontinued the torch cutting of cast iron as much as possible but instead resells it, loads it out whole, breaks it or does not acquire the material. Finally, consistent with its BMPs, R J Torching utilizes SPARCS to torch cut when, based upon its experience, and due to the object's metallurgical properties and size, emissions are expected to exceed the VE limit. In this way R J Torching seeks to reduce or eliminate emissions and to avoid exceeding the VE limit.

On the date of MDEQ's observations, the SPARCS unit was down for repairs, and unavailable for utilization. In its place, alternative methods were employed to assist in controlling emissions. Accordingly, RJI submits that the alleged violation of ACO Appendix A, Paragraph 8 be reconsidered and removed from the Violation Notice.

(3) ACO Appendix A, Paragraph 10: Paragraph 10 states RJ shall utilize the SPARCS units, which are designed to reduce opacity from torch-cutting operations. EPA has determined that SPARCS is an emission control technology, which, if properly maintained and utilized, should result in significant reduction of particulate emissions and opacity from torch-cutting operations to comply with the Michigan Clean Air Act and Rule 333.1301 of the Michigan SIP.

Response:

This paragraph must be read in conjunction with Paragraph 19 of Appendix A to the ACO which provides that torch cutting shall be conducted in a SPARCS unit when, due to the scrap metallurgical properties and size, emissions are expected to exceed the VE limit. RJI does utilize SPARCS, when, consistent with the ACO, it determines that SPARCS should be utilized. (Please see RJI's response to item 2 above, which it incorporates by reference). However, on May 24, 2016 the SPARCS unit was down for repairs, and unavailable for utilization. In its place, alternative methods were employed to assist in controlling emissions.

(4) ACO Paragraph 19: "RJ shall conduct torch cutting in a SPARCS unit at any time when, due to the scraps metallurgical properties and size, emissions are expected to exceed the VE limit."

Response:

On May 24, 2016 the SPARCS unit was down for repairs, and unavailable for utilization. In its place, alternative methods were employed to assist in controlling emissions. Additionally, arrangements were made for delivery of a Buffalo Turbine from Woodhaven Michigan, to assist in controlling torch cutting emissions, which arrived on May 26, and was installed for use commencing May 27, 2016. Please see RJI's response to item 2 above, which it incorporates by reference.

Conclusion

For the reasons set forth above, RJI respectfully requests that MDEQ reconsider its Violation Notice letter dated May 25, 2016, and agree to participate in the Eastern Technical Associates site specific assessment of the VE sources at the RJI's business location in Flint, MI. to help identify the sources of visible emissions and establish sound guidelines for performing visible emission observations on them.

RJT is continuing to implement new procedures to improve its abilities to minimize air emission problems, and has undertaken to address each of the issues raised by MDEQ, which were separately investigated by RJI. As a result, RJI has made improvements to its procedures and has improved the monitoring and supervision of its BMPs.

RJI will continue to cooperate with MDEQ and work to improve its procedures so that VE's can be further reduced.

Very truly,

KOTZ SANGSTER WYSOCKI P.C.

GEORGE F. CURRAN, III

GFC/med
Enclosure
VIA US FIRST CLASS MAIL (WITH ENCLOSURES)
AND EMAIL TO huden@mighigan.gov (WITHE ENCLOSURES)

cc: RJ Torching, Inc., Mr. Jason Roughton (Via Email)

From: John VanZandt
Sent: Monday, May 23, 2016 5:24 PM
To: Jason <Jason@rjind.com>
Cc: Jeff Simpson <jsimpson@rjind.com>; Ken Brooks <kbrooks@rjind.com>
Subject: End of Day Recap 5-23-16

End of Day Recap

Hot Issues: n/a

Problems: The fan blades on the SPARCS unit burned up when the filters caught fire over the weekend. Figgins is replacing them from the spare motor units we have here. We'll need to order replacement blades from Cincinnati Fans.

Ex. 1

From: John VanZandt
Sent: Thursday, May 26, 2016 5:02 PM
To: Jason <Jason@rjind.com>
Cc: Jeff Simpson <jsimpson@rjind.com>; Ken Brooks <kbrooks@rjind.com>
Subject: End of Day Recap 5-26-16

End of Day Recap

Hot Issues: n/a

Problems: n/a

Current Daily Issues:

Smoke-We got the Buffalo Turbine from Woodhaven this morning. It is running and working well. Randy got on Marvin to get the SPARCS unit finished. We got it set up this afternoon and will begin using it tomorrow morning. We pulled Thomas off of the stainless machines he was cutting and have him working for the nonferrous garage.

Ex. 2

Method 9 - Visual Determination of the Opacity of Emissions From Stationary Sources

Many stationary sources discharge visible emissions into the atmosphere; these emissions are usually in the shape of a plume. This method involves the determination of plume opacity by qualified observers. The method includes procedures for the training and certification of observers, and procedures to be used in the field for determination of plume opacity. The appearance of a plume as viewed by an observer depends upon a number of variables, some of which may be controllable and some of which may not be controllable in the field. Variables which can be controlled to an extent to which they no longer exert a significant influence upon plume appearance include: Angle of the observer with respect to the plume; angle of the observer with respect to the sun; point of observation of attached and detached steam plume; and angle of the observer with respect to a plume emitted from a rectangular stack with a large length to width ratio. The method includes specific criteria applicable to these variables.

Other variables which may not be controllable in the field are luminescence and color contrast between the plume and the background against which the plume is viewed. These variables exert an influence upon the appearance of a plume as viewed by an observer, and can affect the ability of the observer to accurately assign opacity values to the observed plume. Studies of the theory of plume opacity and field studies have demonstrated that a plume is most visible and presents the greatest apparent opacity when viewed against a contrasting background. It follows from this, and is confirmed by field trials, that the opacity of a plume, viewed under conditions where a contrasting background is present can be assigned with the greatest degree of accuracy. However, the potential for a positive error is also the greatest when a plume is viewed under such contrasting conditions. Under conditions presenting a less contrasting background, the apparent opacity of a plume is less and approaches zero as the color and luminescence contrast decrease toward zero. As a result, significant negative bias and negative errors can be made when a plume is viewed under less contrasting conditions. A negative bias decreases rather than increases the possibility that a plant operator will be cited for a violation of opacity standards due to observer error.

Studies have been undertaken to determine the magnitude of positive errors which can be made by qualified observers while reading plumes under contrasting conditions and using the procedures set forth in this method. The results of these studies (field trials) which involve a total of 769 sets of 25 readings each are as follows:

(1) For black plumes (133 sets at a smoke generator), 100 percent of the sets were read with a positive error[1] of less than 7.5 percent opacity; 99 percent were read with a positive error of less than 5 percent opacity.

(2) For white plumes (170 sets at a smoke generator, 168 sets at a coal-fired power plant, 298 sets at a sulfuric acid plant), 99 percent of the sets were read with a positive error of less than 7.5 percent opacity; 95 percent were read with a positive error of less than 5 percent opacity. The positive observational error associated with an average of twenty-five readings is therefore established. The accuracy of the method must be taken into account when determining possible violations of applicable opacity standards.

[1] For a set, positive error-average opacity determined by observer' s 25 observations-average opacity determined from transmissometer's 25 recordings.

EX. 3

1. Principle and Applicability

1.1 Principle. The opacity of emissions from stationary sources is determined visually by a qualified observer.

1.2 Applicability. This method is applicable for the determination of the opacity of emissions from stationary sources pursuant to §60.11(b) and for qualifying observers for visually determining opacity of emissions.

2. Procedures

The observer qualified in accordance with section 3 of this method shall use the following procedures for visually determining the opacity of emissions:

2.1 Position. The qualified observer shall stand at a distance sufficient to provide a clear view of the emissions with the sun oriented in the 140° sector to his back. Consistent with maintaining the above requirement, the observer shall, as much as possible, make his observations from a position such that his line of vision is approximately perpendicular to the plume direction, and when observing opacity of emissions from rectangular outlets (e.g., roof monitors, open baghouses, noncircular stacks), approximately perpendicular to the longer axis of the outlet. The observer's line of sight should not include more than one plume at a time when multiple stacks are involved, and in any case the observer should make his observations with his line of sight perpendicular to the longer axis of such a set of multiple stacks (e.g., stub stacks on baghouses).

2.2 Field Records. The observer shall record the name of the plant, emission location, type facility, observer's name and affiliation, a sketch of the observer's position relative to the source, and the date on a field data sheet (Figure 9–1). The time, estimated distance to the emission location, approximate wind direction, estimated wind speed, description of the sky condition (presence and color of clouds), and plume background are recorded on a field data sheet at the time opacity readings are initiated and completed.

2.3 Observations. Opacity observations shall be made at the point of greatest opacity in that portion of the plume where condensed water vapor is not present. The observer shall not look continuously at the plume, but instead shall observe the plume momentarily at 15-second intervals.

2.3.1 Attached Steam Plumes. When condensed water vapor is present within the plume as it emerges from the emission outlet, opacity observations shall be made beyond the point in the plume at which condensed water vapor is no longer visible. The observer shall record the approximate distance from the emission outlet to the point in the plume at which the observations are made.

2.3.2 Detached Steam Plume. When water vapor in the plume condenses and becomes visible at a distinct distance from the emission outlet, the opacity of emissions should be evaluated at the emission outlet prior to the condensation of water vapor and the formation of the steam plume.

2.4 Recording Observations. Opacity observations shall be recorded to the nearest 5 percent at 15-second intervals on an observational record sheet. (See Figure 9–2 for an example.) A minimum of 24 observations shall be recorded. Each momentary observation recorded shall be deemed to represent the average opacity of emissions for a 15-second period.

2.5 Data Reduction. Opacity shall be determined as an average of 24 consecutive observations recorded at 15-second intervals. Divide the observations recorded on the record sheet into sets of 24 consecutive observations. A set is composed of any 24 consecutive observations. Sets need not be consecutive in time and in no case shall two sets overlap. For each set of 24 observations, calculate the average by summing the opacity of the 24 observations and dividing this sum by 24. If an applicable standard specifies an averaging time requiring more than 24 observations, calculate the average for all observations made during the specified time period. Record the average opacity on a record sheet. (See Figure 9–1 for an example.)

3. Qualifications and Testing

3.1 Certification Requirements. To receive certification as a qualified observer, a candidate must be tested and demonstrate the ability to assign opacity readings in 5 percent increments to 25 different black plumes and 25 different white plumes, with an error not to exceed 15 percent opacity on any one reading and an average error not to exceed 7.5 percent opacity in each category. Candidates shall be tested according to the procedures described in section 3.2. Smoke generators used pursuant to section 3.2 shall be equipped with a smoke meter which meets the requirements of section 3.3.

The certification shall be valid for a period of 6 months, at which time the qualification procedure must be repeated by any observer in order to retain certification.

3.2 Certification Procedure. The certification test consists of showing the candidate a complete run of 50 plumes—25 black plumes and 25 white plumes—generated by a smoke generator. Plumes within each set of 25 black and 25 white runs shall be presented in random order. The candidate assigns an opacity value to each plume and records his observation on a suitable form. At the completion of each run of 50 readings, the score of the candidate is determined. If a candidate falls to qualify, the complete run of 50 readings must be repeated in any retest. The smoke test may be administered as part of a smoke school or training program, and may be preceded by training or familiarization runs of the smoke generator during which candidates are shown black and white plumes of known opacity.

3.3 Smoke Generator Specifications. Any smoke generator used for the purposes of section 3.2 shall be equipped with a smoke meter installed to measure opacity across the diameter of the smoke generator stack. The smoke meter output shall display instack opacity based upon a pathlength equal to the stack exit diameter, on a full 0 to 100 percent chart recorder scale. The smoke meter optical design and performance shall meet the specifications shown in Table 9–1.
The smoke meter shall be calibrated as prescribed in section 3.3.1 prior to the conduct of each smoke reading test. At the completion of each test, the zero and span drift shall be checked and if the drift exceeds ±1 percent opacity, the condition shall be corrected prior to conducting any subsequent test runs. The smoke meter shall be demonstrated, at the time of installation, to meet the specifications listed in Table 9–1. This demonstration shall be repeated following any subsequent repair or replacement of the photocell or associated electronic circuitry including the chart recorder or output meter, or every 6 months, whichever occurs first.

Table 9–1—Smoke Meter Design and Performance Specifications

Parameter	Specification
a. Light source	Incandescent lamp operated at nominal rated voltage.
b. Spectral response of photocell	Photopic (daylight spectral response of the human eye—Citation 3).
c. Angle of view	15° maximum total angle.

d. Angle of projection	15° maximum total angle.
e. Calibration error	±3% opacity, maximum.
f. Zero and span drift	±1% opacity, 30 minutes.
g. Response time	5 seconds.

3.3.1 Calibration. The smoke meter is calibrated after allowing a minimum of 30 minutes warmup by alternately producing simulated opacity of 0 percent and 100 percent. When stable response at 0 percent or 100 percent is noted, the smoke meter is adjusted to produce an output of 0 percent or 100 percent, as appropriate. This calibration shall be repeated until stable 0 percent and 100 percent readings are produced without adjustment. Simulated 0 percent and 100 percent opacity values may be produced by alternately switching the power to the light source on and off while the smoke generator is not producing smoke.

3.3.2 Smoke Meter Evaluation. The smoke meter design and performance are to be evaluated as follows:

3.3.2.1 Light Source. Verify from manufacturer's data and from voltage measurements made at the lamp, as installed, that the lamp is operated within ±5 percent of the nominal rated voltage.

3.3.2.2 Spectral Response of Photocell. Verify from manufacturer's data that the photocell has a photopic response; i.e., the spectral sensitivity of the cell shall closely approximate the standard spectral-luminosity curve for photopic vision which is referenced in (b) of Table 9-1.

FIGURE 9-1

RECORD OF VISUAL DETERMINATION OF OPACITY

PAGE ___ OF ___

COMPANY _____

LOCATION _____

TEST NUMBER _____

DATE _____

TYPE FACILITY _____

CONTROL DEVICE _____

HOURS OF OBSERVATION _____

OBSERVER _____

OBSERVER CERTIFICATION DATE _____

OBSERVER AFFILIATION _____

POINT OF EMISSIONS _____

HEIGHT OF DISCHARGE POINT _____

CLOCK TIME	Initial			Final
OBSERVER LOCATION Distance to Discharge				
Direction From Discharge				
Height of Observation Point				
BACKGROUND DESCRIPTION				
WEATHER CONDITIONS Wind Direction				
Wind Speed				
Ambient Temperature				
SKY CONDITIONS (clear, overcast, % cloud, type)				
PLUME DESCRIPTION Color				
Emission Opacity				
OTHER INFORMATION				

SUMMARY OF AVERAGE OPACITY

Set Number	Time Start--End	Opacity Sum	Opacity Average

Readings ranged from ____ to ____ % opacity.

The source was/was not in compliance with ____ at the time evaluation was made.

Figure 9–2—Observation Record

Company	Observer
Location	Type facility
Test Number	Point of emissions
Date	

Hr.	Min.	Seconds				Steam plume (check if applicable)		Comments
		0	15	30	45	Attached	Detached	
	0							
	1							
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9							
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	28							
	29							

Company	Observer
Location	Type facility
Test Number	Point of emissions
Date	

Hr.	Min.	Seconds				Steam plume (check if applicable)		Comments
		0	15	30	45	Attached	Detached	
	30							
	31							
	32							
	33							
	34							
	35							
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3.3.2.3 Angle of View. Check construction geometry to ensure that the total angle of view of the smoke plume, as seen by the photocell, does not exceed 15°. The total angle of view may be calculated from: $\Theta = 2 \tan^{-1} d/2L$, where Θ = total angle of view; d = the sum of the photocell diameter + the diameter of the limiting aperture; and L = the distance from the photocell to the limiting aperture. The limiting aperture is the point in the path between the photocell and the smoke plume where the angle of view is most restricted. In smoke generator smoke meters this is normally an orifice plate.

3.3.2.4 Angle of Projection. Check construction geometry to ensure that the total angle of projection of the lamp on the smoke plume does not exceed 15°. The total angle of projection may be calculated from: $\Theta = 2 \tan^{-1} d/2L$, where Θ = total angle of projection; d=the sum of the length of the lamp filament + the diameter of the limiting aperture; and L = the distance from the lamp to the limiting aperture.

3.3.2.5 Calibration Error. Using neutral-density filters of known opacity, check the error between the actual response and the theoretical linear response of the smoke meter. This check is accomplished by first calibrating the smoke meter according to 3.3.1 and then inserting a series of three neutral-density filters of nominal opacity of 20, 50, and 75 percent in the smoke meter pathlength. Filters calibrated within ±2 percent shall be used. Care should be taken when inserting the filters to prevent stray light from affecting the meter. Make a total of five nonconsecutive readings for each filter. The maximum error on any one reading shall be 3 percent opacity.

3.3.2.6 Zero and Span Drift. Determine the zero and span drift by calibrating and operating the smoke generator in a normal manner over a 1-hour period. The drift is measured by checking the zero and span at the end of this period.

3.3.2.7 Response Time. Determine the response time by producing the series of five simulated 0 percent and 100 percent opacity values and observing the time required to reach stable response. Opacity values of 0 percent and 100 percent may be simulated by alternately switching the power to the light source off and on while the smoke generator is not operating.

4. Bibliography

1. Air Pollution Control District Rules and Regulations, Los Angeles County Air Pollution Control District, Regulation IV, Prohibitions, Rule 50.

2. Weisburd, Melvin I., Field Operations and Enforcement Manual for Air, U.S. Environmental Protection Agency, Research Triangle Park, NC. APTD–1100, August 1972, pp. 4.1–4.36.

3. Condon, E.U., and Odishaw, H., Handbook of Physics, McGraw-Hill Co., New York, NY, 1958, Table 3.1, p. 6–52.