

COMPLIANCE TEST REPORT

for

QUARTERLY HYDROGEN CHLORIDE (HCL) EMISSIONS

EU-BOILER7-SC (Unit 7)

SRN: B2796

3rd Quarter 2020

St. Clair Power Plant
East China, Michigan

September 10, 2020

Prepared By:
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The logo for DTE, consisting of the letters 'DTE' in a bold, black, sans-serif font.



1.0 INTRODUCTION

DTE Energy's Environmental Management and Safety (EM&S) Field Services Group performed the 3rd Quarter – 2020 Hydrogen Chloride (HCl) emissions test on the exhaust of EU-BOILER7-SC at the St. Clair Power Plant, located in East China, Michigan. The testing was required by the 40 CFR Part 63, Subpart UUUUU (Mercury and Air Toxics Standards - MATS) to document quarterly HCl stack emissions. Testing was conducted on September 10, 2020.

Testing was performed pursuant to USEPA Method 26A (Modified).

The fieldwork was performed in accordance with EPA Reference Methods and DTE Energy Intent to Test¹. Emissions testing was performed utilizing Method 26A (modified as a single point sample) due equipment availability limitations which did not allow for FTIR analysis. The following DTE Energy personnel participated in the testing program: Mr. Mark Grigereit, Principal Engineer, Mr. Thomas Snyder, Environmental Specialist, and Mr. Fred Meinecke, Senior Environmental Technician. Mr. Grigereit was the project leader. Mr. Dominic Vendittelli, Environmental Engineer at the plant provided process coordination for the testing program.

2.0 SOURCE DESCRIPTION

The St Clair Power Plant (SCPP) located at 4901 Pointe Drive in East China, Michigan, employs the use of four (4) coal-fired boilers (Units 2-3, 6, and 7). Units 2 and 3 each have Babcock and Wilcox boilers capable of producing 1,070,000 pounds per hour of steam. Units 2 and 3 have Allis Chalmers turbine generators each with a nominally rated capability of 170 MW. Full load capability for Units 2-3, while firing coal only, are 135 MW and 150 MW while over-firing with oil.

Units 6 and 7 have Combustion Engineering boilers capable of producing 2,100,000 and 3,580,000 pounds of steam per hour respectively. The turbine generators on each unit were manufactured by Westinghouse and have a nominally rated capability of 325 and 500 megawatts respectively. Full load capability for Units 6 and 7 while firing coal only is approximately 315 MW and 470 MW respectively.

The air pollution control equipment on Units 2 and 3 consists of Wheelabrator Frye electrostatic precipitators on each unit that have design collection efficiencies of 99.6%. Each exhaust stack is 599 feet tall with an internal diameter of 13.3 feet. The air

¹ EGLE, Test Plan, Submitted October 23, 2017. (Attached-Appendix A)

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pollution control equipment on Unit 6 consists of Research Corporation electrostatic precipitators that have design collection efficiencies of 99.6%. The exhaust stack is 425 feet tall with an internal diameter of 19.0 feet. The air pollution control equipment on EU-BOILER7-SC consists of an American Standard electrostatic precipitator that has design collection efficiency of 99.6%. The exhaust stack is 600 feet tall with an internal diameter of 16.0 feet

Each boiler is equipped with a Dry Sorbent Injection (DSI) and Activated Carbon Injection (ACI) air quality control system. The DSI system is used to control acid gas, PM, PM₁₀, PM_{2.5}, and NO_x emissions from each unit. Trona is received at the plant where inline mills further refine the Trona. The ACI system is used to control Mercury emissions from each unit.

Testing was performed on EU-BOILER7-SC while operating at normal load conditions, per Subpart UUUUU.

3.0 SAMPLING AND ANALYTICAL PROCEDURES

DTE Energy obtained emissions measurements in accordance with procedures specified in the USEPA *Standards of Performance for New Stationary Sources* or listed as an approved "Other Test Method". The sampling and analytical methods used in the testing program are indicated in the table below:

Sampling Method	Parameter	Analysis
USEPA Method 3A	Oxygen & CO ₂	Instrumental Analyzer Method
USEPA Method 4	Moisture Content	Field data analysis and reduction
USEPA Method 26a	Hydrogen Chloride	Ion Chromatography
USEPA Method 19	Emission Rate Calculations	Stoichiometric Calculations

3.1 OXYGEN AND CARBON DIOXIDE (USEPA Method 3A)

3.1.1 Sampling Method

Stack gas oxygen (O₂) and carbon dioxide (CO₂) emissions were evaluated using USEPA Method 3A, "Gas Analysis for Carbon Dioxide, Oxygen, Excess Air, and Dry



Analysis of the Method 26A samples and blanks were conducted by Bureau Veritas Analytics. All analysis followed the procedures listed in USEPA Method 26A. A complete laboratory report is in Appendix E.

Field data sheets for the Method 26A sampling are in Appendix B.

4.0 OPERATING PARAMETERS

The test program included the collection of boiler load and stack emissions CEMs data during each test run. Parameters recorded included gross Megawatts (GMW) and CEMs data (SO₂, NO_x, CO₂, and opacity). Additionally, dry sorbent injection rates (DSI) and activated carbon injection rates (ACI), in pounds per hour (lb/hr), are reported. Operational Data collected during the testing is presented in Appendix C.

During each day of emissions sampling, a representative coal sample was collected from the unit and analyzed for ultimate and proximate analysis, including % Sulfur, % Ash, and heat content. The results of the coal analysis were used to calculate an Fc value for each day of testing and used in the lb/MMBtu calculations. Results of the fuel analysis can be referred to in Appendix E.

5.0 DISCUSSION OF RESULTS

Table 1 presents the HCl emission testing results from EU-BOILER7-SC. HCl emissions are presented in parts per million on a wet basis (ppm_w) and pounds per million BTU (lbs/MMBtu). The EU-BOILER7-SC HCl emissions during testing demonstrated an average concentration of 0.25 ppm and emission factor of 0.0005 lb/MMBtu. This is below the Subpart UUUUU limit of 0.002 lb/MMBtu.

The auxiliary test data presented in the results table for each test includes the unit load in gross megawatts (GMW), DSI injection rate (lb/hr), ACI injection rate (lb/hr), and CO₂ concentration (%_{wet}).



6.0 CERTIFICATION STATEMENT

"I certify that I believe the information provided in this document is true, accurate, and complete. Results of testing are based on the good faith application of sound professional judgment, using techniques, factors, or standards approved by the Local, State, or Federal Governing body, or generally accepted in the trade."

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RESULTS TABLE

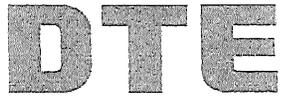


TABLE NO. 1
HYDROGEN CHLORIDE EMISSIONS TESTING RESULTS
St.Clair Power Plant - EU-BOILER7-SC (Unit 7)
September 10, 2020

Test	Test Date	Test Time (DAHS Time)	Unit Load (GMW)	DSI Injection Rate (lb/hr)	ACI Injection Rate (lb/hr)	CO ₂ Concentration (%)	HCl Concentration (ppmv)	HCl Emissions (lbs/MMBtu) ⁽¹⁾
HCl-1	10-Sep-20	6:34-7:34	275.1	0	50	12.7	0.28	0.0005
HCl-2		7:48-8:48	275.1	0	53	12.9	0.23	0.0004
HCl-3		9:01-10:01	<u>275.1</u>	<u>0</u>	<u>53</u>	<u>13.0</u>	<u>0.25</u>	<u>0.0004</u>
		<i>Average:</i>	<i>275.1</i>	<i>0</i>	<i>52</i>	<i>12.9</i>	<i>0.25</i>	<i>0.0005</i>

(1) MATS Limit = 0.002 lb/MMBtu

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FIGURES

Figure 1 – Sampling Location
 St.Clair Power Plant – EU-BOILER7-SC (Unit 7)

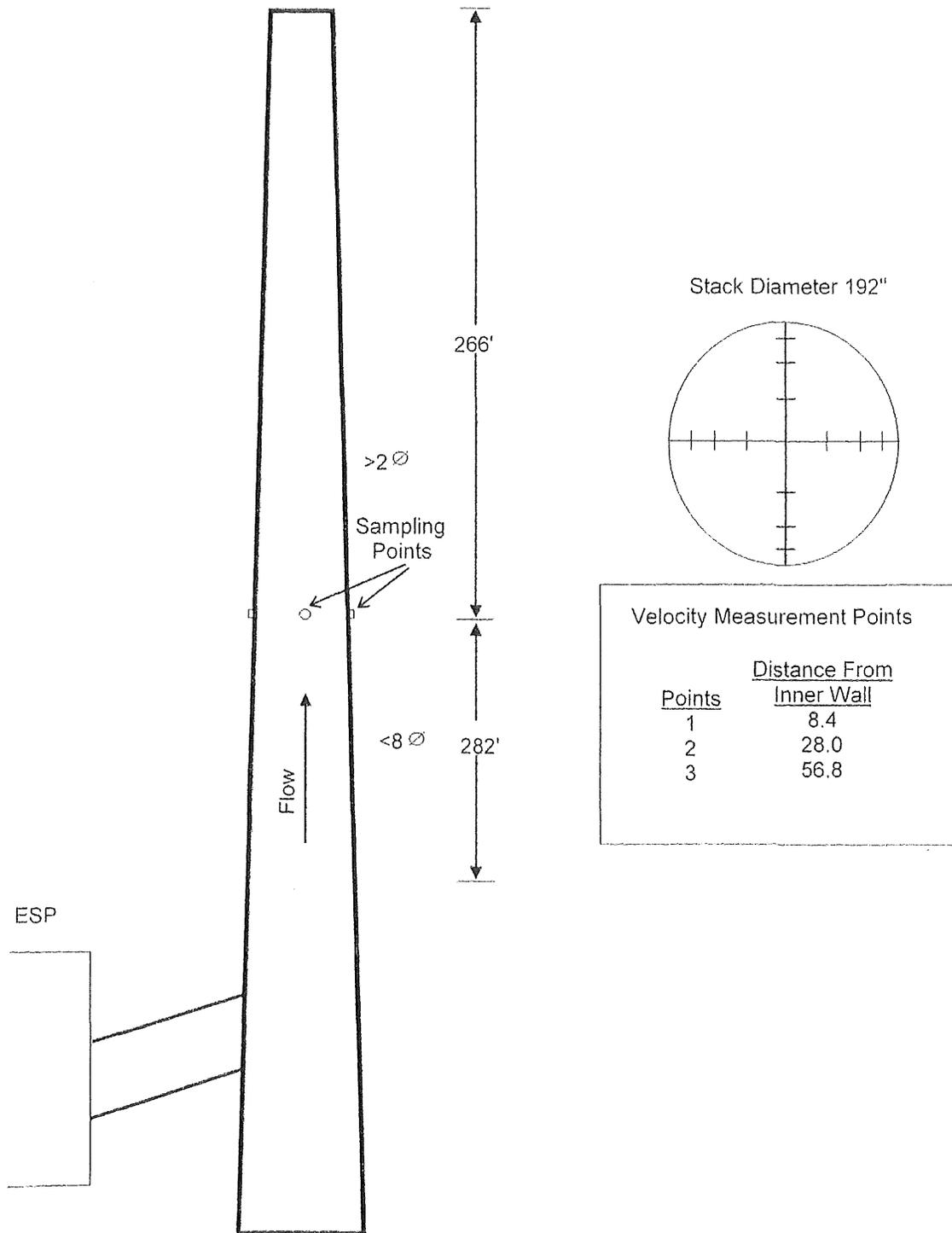


Figure 2 – USEPA Method 26A (Modified)
St. Clair Power Plant

