



# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

[www.ct.gov/csc](http://www.ct.gov/csc)

### VIA ELECTRONIC MAIL

May 21, 2018

Colin M. Kelly, Asset Manager

CPV Towantic, LLC

[ckelly@cpv.com](mailto:ckelly@cpv.com)

[rlockhart@cpvtowantic.com](mailto:rlockhart@cpvtowantic.com)

RE: **DOCKET 192B-** CPV Towantic, LLC Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a 785 MW dual-fuel combined cycle electric generating facility located north of the Prokop Road and Towantic Hill Road intersection in the Town of Oxford, Connecticut.

Dear Mr. Kelly:

The Connecticut Siting Council (Council) is in receipt of the final Noise Monitoring Test Report dated May 17, 2018 and submitted in compliance with Section (g) of the Council's Development and Management Plan Decision dated September 4, 2015.

This applies only to the final Noise Monitoring Test Report dated May 17, 2018. Any significant changes to the above-referenced project require advance Council notification and approval.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman

Executive Director

MB/MP/laf

c: Parties and Intervenors  
Council Members



**From:** Ryan Lockhart [<mailto:rlockhart@cpvtowantic.com>]

**Sent:** Thursday, May 17, 2018 1:50 PM

**To:** CSC-DL Siting Council <[Siting.Council@ct.gov](mailto:Siting.Council@ct.gov)>

**Cc:** 'fderosa@brownrudnick.com'; 'psmall@brownrudnick.com'; 'dangelo.middlebury@snet.net'; 'attystephensavarese@gmail.com'; 'bernacr@nu.com'; 'paccess@nu.com'; 'cochrjd@nu.com'; 'condonsavitt@comcast.net'; 'johnnytroutseed@charter.net'; 'selectman@southbury-ct.gov'; 'ldejong@pomperaug.org'; 'jmalcynsky@gaffneybennett.com'; 'fitz@fmslaw.org'; 'alicia@fmslaw.org'; 'ray@ctcombustion.com'; 'wayne@waynemccormack.com'; 'kznrrg@sbcglobal.net'; 'ktruini@westoverschool.org'; 'ahallaran@westoverschool.org'; 'ehill@cappalihill.com'; 'ingridmanning2@gmail.com'; 'wsp@aya.yale.edu'; Andy Bazinet <[abazinet@cpv.com](mailto:abazinet@cpv.com)>; [rjm62156@aol.com](mailto:rjm62156@aol.com); Colin Kelly <[ckelly@cpv.com](mailto:ckelly@cpv.com)>; Jamie Pike <[jpike@cpv.com](mailto:jpike@cpv.com)>

**Subject:** CPV Towantic Final Noise Monitoring Test Submittal

All,

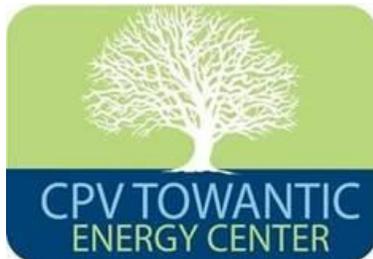
Please see attached notification per condition (g); Final Noise Mitigation Measures and Plans to Demonstrate Compliance with DEEP Noise Standards; Submittal of Final Noise Monitoring Test Report.

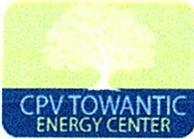
Best Regards,

Ryan Lockhart

**CPV Towantic Energy Center**

(203)-215-9372





May 17, 2018

VIA EMAIL AND FIRST CLASS MAIL

Ms. Melanie Bachman  
Executive Director  
Connecticut Siting Council  
Ten Franklin Square  
New Britain, CT. 06051

Re: DOCKET 192B – CPV Towantic LLC; CSC Decision and Order Condition (g); Final Noise Mitigation Measures and Plans to Demonstrate Compliance with DEEP Noise Standards; Submittal of Final Noise Monitoring Test Report

Dear Ms. Bachman:

CPV Towantic is submitting a final far field sound test conducted by Acentech Incorporated. The attached test report was conducted on April 26 and 27, 2018. The report concludes CPV Towantic, LLC demonstrates compliance of the facility's sound with the project limits.

Thank you for your consideration and should you have any questions or require additional information, please feel free to contact me anytime.

Sincerely,

A handwritten signature in black ink, appearing to read "Colin M. Kelly", with a long, sweeping underline that extends to the right.

Colin M. Kelly  
CPV Towantic, LLC  
Asset Manager  
[ckelly@cpv.com](mailto:ckelly@cpv.com)

cc: CSC Service List  
Brown Rudnick  
Jamie Pike



33 Moulton Street  
Cambridge MA 02138  
617 499 8000  
acentech.com



7 May 2018

Gemma Power Systems, LLC.  
769 Hebron Avenue  
Glastonbury, CT 06033

\*\*\* via email – keithprice@gemmapower.com \*\*\*

Subject: Facility Operation Far Field Sound Test  
CPV Towantic Energy Center  
Oxford, CT  
Acentech Project No. 629152

Attention: Keith Price, PE  
Project Engineering Manager

Dear Mr. Price:

## INTRODUCTION

At your request, Acentech conducted a series of sound measurements and observations in the vicinity of the CPV Towantic Energy Center Generation Facility in Oxford, CT. The purpose of the measurements was to document the far field sound levels during full load operation and to compare them to the project contract's noise limits ("Far Field Noise Limits"). This 2x1 combined cycle natural gas-fired electrical generating facility is nominally rated at 805 MWe. The plant uses two General Electric 7HA.01 combustion turbine generators (CTGs), two CMI heat recovery steam generators (HRSGs) with supplementary firing, one GE D602 steam turbine generator (STG), air cooled condenser, transformers, and other support equipment.

On 26 and 27 April 2018, R. Gomez of Acentech met with you and obtained sound data and observations at four far field locations while the plant was operating at nominal full load conditions. The microphone was fitted with the manufacturer's recommended windscreen, tripod-mounted about five (5) feet above the ground, and removed from any large, vertical reflective surface. The meter was set with the fast time constant and its calibration was checked in the field directly before and after conducting the series of measurements. Weather conditions on the afternoon of 26 April 2018 during the test included a 65 to 68°F air temperature, modest to gusty winds (1 to 6 mph/W), and a partly cloudy sky. In addition to sound from the facility, we noted that sounds of birds, barking dogs, local traffic, backup alarms, off-site idling trucks, and wind in trees contributed to the overall community sound levels. Due to high background sound levels associated with wind in the trees during the first day, the test was continued and additional measurements were obtained during the morning of 27 April 2108 at two far field locations, RES-E and RES-S. Weather conditions on 27 April 2018 included a 52 to 60°F air temperature, calm to modest winds (0 to 2 mph/E), and an overcast sky; and sound sources included the plant, birds, and backup alarms. The instruments that we employed for the sound measurements are listed on Table 1, and their associated lab calibration certificates are presented in Appendix A. The attached test protocol (see Appendix B) provided guidance for the measurement and reporting of the operation sound levels. This letter report summarizes the results of the 26 and 27 April 2018 operation sound measurements, which demonstrated compliance with the project noise limits at all four of the far field noise receptor points.

## PROJECT NOISE LIMITS AND RESULTS

Figure 1 is an aerial photograph that shows the facility site and the four far field sound measurement locations (RES-N, RES-S, RES-E, and PL-E) at and outside of the facility's property line. Table 2 presents the A-weighted

sound levels (L90, dBA) measured at the four locations and compares them to their respective limits. The results indicate measured sound levels of 44 dBA vs. the 51 dBA limit at RES-N, 51 dBA vs. the 51 dBA limit at RES-S, 49 dBA vs. the 51 dBA limit at RES-E, and 66 dBA vs. the 70 dBA limit at PL-E. Table 3 presents the associated octave band data obtained at each location. The supplemental data that we collected during our test, including 1/3-octave band sound pressure levels and other parameters beside L90 (e.g., L1, L10, L50, and Leq), will be maintained in our project file.

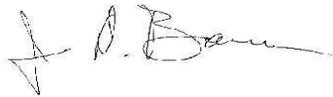
## CONCLUSION

The measured overall A-weighted sound levels (dBA) at the four far field locations did not exceed the "Far Field Noise Limits" for the project. This result demonstrates compliance of the facility's sound with the project limits.

\*\*\*\*\*

Please contact me if you have any questions or comments about our measurements or this letter report. I may be reached directly at 617-499-8018 and [jbarnes@acentech.com](mailto:jbarnes@acentech.com).

Sincerely yours,  
ACENTECH INCORPORATED

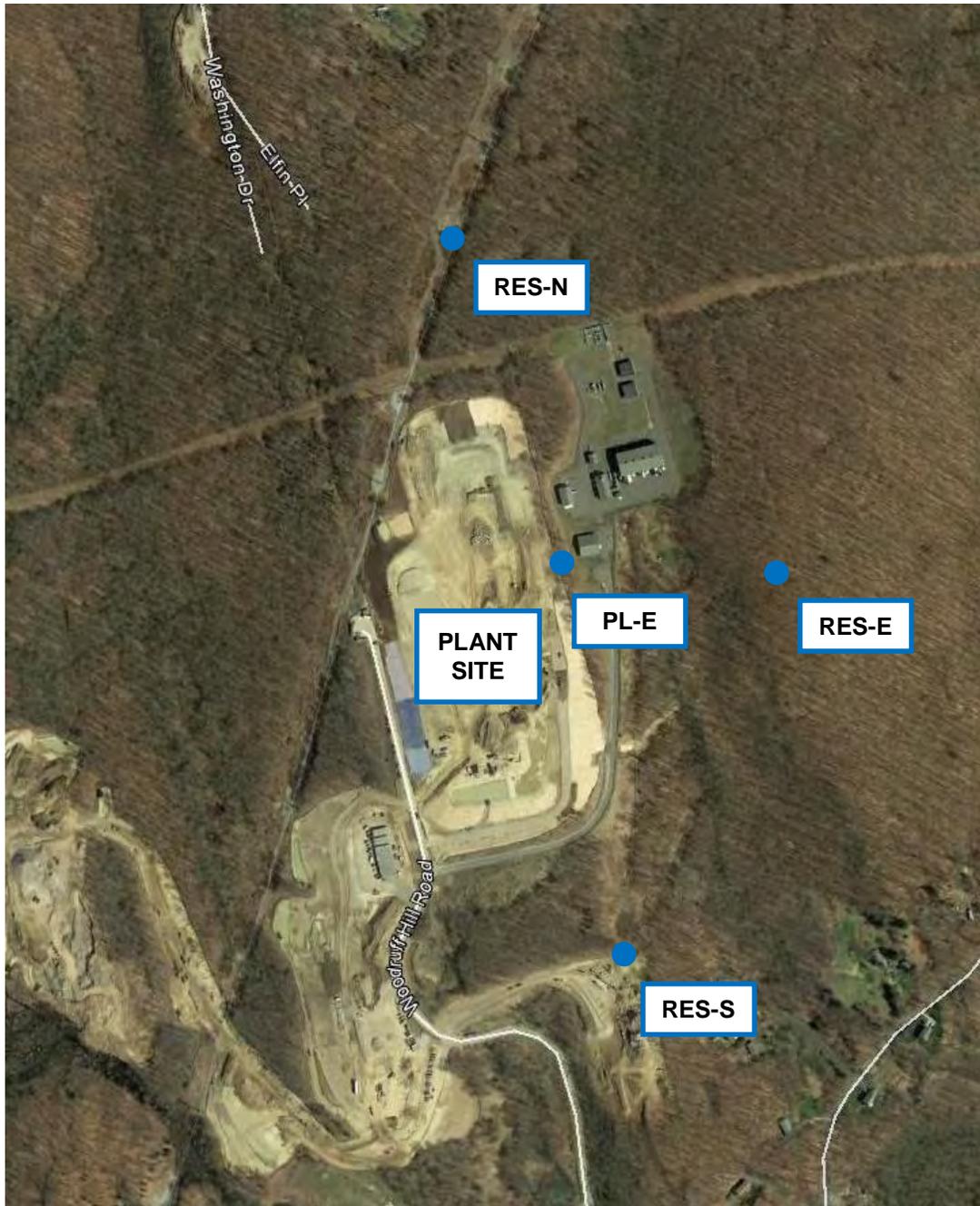


James D. Barnes, F. INCE

Figure 1  
Tables 1 - 3  
Appendices A and B

J:\ 629152-Gemma-Towantic-test report050718.docx

**Figure 1.**  
**Aerial Photo of CPV Towantic Energy Center Site and**  
**Far Field Noise Receptor Locations RES-N, RES-S, RES-E, and PL-E.**



**Table 1.**  
**List of Acoustic Instrumentation Used for Sound Measurements on 26 and 27 April 2018.**

Instrument Type	Manufacturer	Model	Serial No.
Precision Sound Level Meter and 1/1 and 1/3-Octave Band Analyzer	Rion	NA-28	00370313
Preamplifier	Rion	NH-23	60322
1/2" Microphone	Rion	UC-59	02955
Acoustic Calibrator	Norsonic	1251	26625

**Table 2.**  
**Summary of Overall A-Weighted Sound Levels (L90, dBA) Measured at Far Field Noise Receptor Point Locations during Full Load Operation on 26 and 27 April 2018 Compared with Contract Limit.**

Noise Receptor ID	Noise Receptor Location/Description	Full Load Operation (dBA)	Sound Level Limit (dBA)
RES-N	Residential Land Boundary - North	44	51
RES-S	Residential Land Boundary - South	51	51
RES-E	Residential Land Boundary - East	49	51
PL-E	Industrial Property Line East of Site	66	70

**Table 3.**  
**Summary of L90 Octave Band Sound Pressure Levels (dB) and Overall A-Weighted Sound Levels (dBA) Measured at Far Field Noise Receptor Point Locations during Nominal Full Load Operation on 26 and 27 April 2018.**

Location	Octave Band Center Frequency (Hz)									dBA
	31.5	63	125	250	500	1000	2000	4000	8000	
RES-N	58	60	53	39	40	38	35	24	13	44
RES-S	59	60	48	48	50	44	41	32	15	51
RES-E	62	61	55	46	45	43	41	33	15	49
PL-E	70	80	71	59	60	60	60	54	42	66

**Appendix A**  
**Instrument Laboratory Calibration Certificates**

**Scantek, Inc.**  
 CALIBRATION LABORATORY

ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1  
 ACCREDITED by NVLAP (an ILAC MRA signatory)

**NVLAP**<sup>®</sup>  
 CALIBRATION  
 NVLAP Lab Code: 200625-0

## Calibration Certificate No.39930

<b>Instrument:</b>	<b>Sound Level Meter</b>	<b>Date Calibrated:</b>	<b>1/12/2018</b>	<b>Cal Due:</b>	
<b>Model:</b>	<b>NA28</b>	<b>Status:</b>	<b>Received</b>	<b>Sent</b>	
<b>Manufacturer:</b>	<b>Rion</b>	<b>In tolerance:</b>	<b>X</b>	<b>X</b>	
<b>Serial number:</b>	<b>00370313</b>	<b>Out of tolerance:</b>			
<b>Tested with:</b>	<b>Microphone UC-59 s/n 02955</b>	<b>See comments:</b>			
	<b>Preamplifier NH23 s/n 60322</b>	<b>Contains non-accredited tests:</b>	<b>Yes</b>	<b>X</b>	<b>No</b>
<b>Type (class):</b>	<b>1</b>	<b>Calibration service:</b>	<b>Basic</b>	<b>X</b>	<b>Standard</b>
<b>Customer:</b>	<b>Acentech, Inc.</b>	<b>Address:</b>	<b>33 Moulton Street</b>		
<b>Tel/Fax:</b>	<b>617-499-8010 / 617-499-8074</b>		<b>Cambridge, MA 02138</b>		

**Tested in accordance with the following procedures and standards:**  
 Calibration of Sound Level Meters, Scantek Inc., Rev. 6/26/2015  
 SLM & Dosimeters – Acoustical Tests, Scantek Inc., Rev. 7/6/2011

**Instrumentation used for calibration: Nor-1504 Norsonic Test System:**

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence	Cal. Due
				Cal. Lab / Accreditation	
483B-Norsonic	SME Cal Unit	31061	Jul 28, 2017	Scantek, Inc./ NVLAP	Jul 28, 2018
D5-360-SRS	Function Generator	88077	Sep 15, 2016	ACR Env./ A2LA	Sep 15, 2018
34401A-Agilent Technologies	Digital Voltmeter	MY47011118	Sep 20, 2017	ACR Env./ A2LA	Sep 20, 2018
HM30-Thommen	Meteo Station	1040170/39633	Oct 25, 2017	ACR Env./ A2LA	Oct 25, 2018
PC Program 1019 Norsonic	Calibration software	v.6.1T	Validated Nov 2014	Scantek, Inc.	-
1251-Norsonic	Calibrator	30878	Nov 10, 2017	Scantek, inc./ NVLAP	Nov 10, 2018

**Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK).**

**Environmental conditions:**

Temperature (°C)	Barometric pressure (kPa)	Relative Humidity (%)
24.9	99.00	36.6

Calibrated by:	Jeremy Gotwalt	Authorized signatory:	Steven E. Marshall
Signature	<i>Jeremy Gotwalt</i>	Signature	<i>Steven E. Marshall</i>
Date	1/12/18	Date	1/15/2018

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 This Calibration Certificate or Test Reports shall not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.  
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**Results summary:** Device complies with following clauses of mentioned specifications:

1 CLAUSES FROM IEC/ANSI STANDARDS REFERENCED IN PROCEDURES:	RESULT <sup>2,3</sup>	EXPANDED UNCERTAINTY (coverage factor 2) [dB]
INDICATION AT THE CALIBRATION CHECK FREQUENCY - IEC61672-3 ED.2 CLAUSE 10	Passed	0.15
SELF-GENERATED NOISE - IEC 61672-3 ED.2 CLAUSE 11	Passed	0.3
FREQUENCY WEIGHTINGS: A NETWORK - IEC 61672-3 ED.2.0 CLAUSE 13	Passed	0.2
FREQUENCY WEIGHTINGS: C NETWORK - IEC 61672-3 ED.2.0 CLAUSE 13	Passed	0.2
FREQUENCY WEIGHTINGS: Z NETWORK - IEC 61672-3 ED.2.0 CLAUSE 13	Passed	0.2
FREQUENCY AND TIME WEIGHTINGS AT 1 KHZ IEC 61672-3 ED.2.0 CLAUSE 14	Passed	0.2
LEVEL LINEARITY ON THE REFERENCE LEVEL RANGE - IEC 61672-3 ED.2 CLAUSE 16	Passed	0.25
LEVEL LINEARITY INCLUDING THE LEVEL RANGE CONTROL - IEC 61672-3 ED.2.0 CLAUSE 17	Passed	0.25
TONEBURST RESPONSE - IEC 61672-3 ED.2.0 CLAUSE 18	Passed	0.3
PEAK C SOUND LEVEL - IEC 61672-3 ED.2.0 CLAUSE 19	Passed	0.35
OVERLOAD INDICATION - IEC 61672-3 ED.2.0 CLAUSE 20	Passed	0.25
HIGH LEVEL STABILITY TEST - IEC 61672-3 ED.2.0 CLAUSE 21	Passed	0.1
LONG TERM STABILITY TEST - IEC 61672-3 ED.2.0 CLAUSE 25	Passed	0.1
FILTER TEST 1/OCTAVE: RELATIVE ATTENUATION - IEC 61260, CLAUSE 4.4 & #5.3	Passed	0.25
FILTER TEST 1/3OCTAVE: RELATIVE ATTENUATION - IEC 61260, CLAUSE 4.4 & #5.3	Passed	0.25
COMBINED ELECTRICAL AND ACOUSTICAL TEST - IEC 61672-3 ED.2.0 CLAUSE 13	Passed	See test report

<sup>1</sup> The results of this calibration apply only to the instrument type with serial number identified in this report.

<sup>2</sup> Parameters are certified at actual environmental conditions.

<sup>3</sup> The tests marked with (\*) are not covered by the current NVLAP accreditation.

**Comments:** The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organization responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2, to demonstrate that the model of sound level meter fully conforms to the requirements in the IEC 61672-2, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1.

**Note:** The instrument was tested for the parameters listed in the table above, using the test methods described in the listed standards. All tests were performed around the reference conditions. The test results were compared with the manufacturer's or with the standard's specifications, whichever are larger.

Compliance with any standard cannot be claimed based solely on the periodic tests.

**Tests made with the following attachments to the instrument:**

Microphone: Rion UC-59 s/n 02955 for acoustical test
Preamplifier: Rion NH23 s/n 60322 for all tests
Other: line adaptor ADP005 (18pF) for electrical tests
Accompanying acoustical calibrator: Norsonic 1251 s/n 26625
Windscreen: none

**Measured Data:** In Test Report # 39930 of 9+1 pages

**Place of Calibration:** Scantek, Inc.  
 6430 Dobbin Road, Suite C  
 Columbia, MD 21045 USA

Ph/Fax: 410-290-7726/ -9167  
[callab@scantekinc.com](mailto:callab@scantekinc.com)

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**Scantek, Inc.**  
 CALIBRATION LABORATORY

ISO 17025: 2005, ANSI/NCCL Z540:1994 Part 1  
 ACCREDITED by NVLAP (an ILAC MRA signatory)

**NVLAP**<sup>®</sup>  
 CALIBRATION  
 NVLAP Lab Code: 200625-0

## Calibration Certificate No.39929

<b>Instrument:</b>	<b>Acoustical Calibrator</b>	<b>Date Calibrated:</b>	<b>1/12/2018</b>	<b>Cal Due:</b>	
<b>Model:</b>	<b>1251</b>	<b>Status:</b>	<b>Received</b>	<b>Sent</b>	
<b>Manufacturer:</b>	<b>Norsonic</b>	<b>In tolerance:</b>	<b>X</b>	<b>X</b>	
<b>Serial number:</b>	<b>26625</b>	<b>Out of tolerance:</b>			
<b>Class (IEC 60942):</b>	<b>1</b>	<b>See comments:</b>			
<b>Barometer type:</b>		<b>Contains non-accredited tests:</b>	<b>___Yes <u>X</u> No</b>		
<b>Barometer s/n:</b>		<b>Customer:</b>	<b>Acentech, Inc.</b>		
<b>Customer:</b>	<b>Acentech, Inc.</b>	<b>Address:</b>	<b>33 Moulton Street</b>		
<b>Tel/Fax:</b>	<b>617-499-8010 / 617-499-8074</b>		<b>Cambridge, MA 02138</b>		

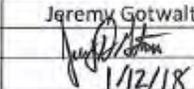
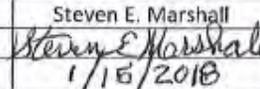
**Tested in accordance with the following procedures and standards:**

Calibration of Acoustical Calibrators, Scantek Inc., Rev. 10/1/2010

**Instrumentation used for calibration: Nor-1504 Norsonic Test System:**

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence	Cal. Due
				Cal. Lab / Accreditation	
483B-Norsonic	SME Cal Unit	31061	Jul 28, 2017	Scantek, Inc./ NVLAP	Jul 28, 2018
DS-360-SRS	Function Generator	88077	Sep 15, 2016	ACR Env./ A2LA	Sep 15, 2018
34401A-Agilent Technologies	Digital Voltmeter	MY47011118	Sep 20, 2017	ACR Env./ A2LA	Sep 20, 2018
HM30-Thommen	Meteo Station	1040170/39633	Oct 25, 2017	ACR Env./ A2LA	Oct 25, 2018
140-Norsonic	Real Time Analyzer	1403978	Mar 22, 2017	Scantek, Inc. / NVLAP	Mar 22, 2018
PC Program 1018 Norsonic	Calibration software	v.6.1T	Validated Nov 2014	Scantek, Inc.	-
4192-Brüel&Kjaer	Microphone	2854675	Nov 11, 2017	Scantek, Inc. / NVLAP	Nov 11, 2018
1203-Norsonic	Preamplifier	92268	Oct 18, 2017	Scantek, Inc./ NVLAP	Oct 18, 2018

**Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK)**

<b>Calibrated by:</b>	Jeremy Gotwalt	<b>Authorized signatory:</b>	Steven E. Marshall
Signature		Signature	
Date	1/12/18	Date	1/15/2018

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Page 1 of 2

**Results summary:** Device was tested and complies with following clauses of mentioned specifications:

CLAUSES <sup>1</sup> FROM STANDARDS REFERENCED IN PROCEDURES:	MET <sup>2</sup>	NOT MET	COMMENTS
<b>Manufacturer specifications</b>			
Manufacturer specifications: Sound pressure level	X		
Manufacturer specifications: Frequency	X		
Manufacturer specifications: Total harmonic distortion	X		
<b>Current standards</b>			
ANSI S1.40:2006 B.3 / IEC 60942: 2003 B.2 - Preliminary inspection	X		
ANSI S1.40:2006 B.4.4 / IEC 60942: 2003 B.3.4 - Sound pressure level	X		
ANSI S1.40:2006 A.5.4 / IEC 60942: 2003 A.4.4 - Sound pressure level stability	X		
ANSI S1.40:2006 B.4.5 / IEC 60942: 2003 B.3.5 - Frequency	X		
ANSI S1.40:2006 B.4.6 / IEC 60942: 2003 B.3.6 - Total harmonic distortion	X		

<sup>1</sup> The results of this calibration apply only to the instrument type with serial number identified in this report.

<sup>2</sup> The tests marked with (\*) are not covered by the current NVLAP accreditation.

**Main measured parameters <sup>3</sup>:**

Measured <sup>4</sup> /Acceptable <sup>5</sup> Tone frequency (Hz):	Measured <sup>4</sup> /Acceptable <sup>5</sup> Total Harmonic Distortion (%):	Measured <sup>4</sup> /Acceptable Level <sup>5</sup> (dB):
1000.26 ± 1.0/1000.0 ± 10.0	1.13 ± 0.25/ < 3	114.02 ± 0.12/114.0 ± 0.4

<sup>3</sup> The stated level is valid at reference conditions.

<sup>4</sup> The above expanded uncertainties for frequency and distortion are calculated with a coverage factor k=2; for level k=2.00

<sup>5</sup> Acceptable parameters values are from the current standards

**Environmental conditions:**

Temperature (°C)	Barometric pressure (kPa)	Relative Humidity (%)
24.0 ± 1.1	99.48 ± 0.025	35.8 ± 2.3

**Tests made with following attachments to instrument:**

Calibrator 1/8" Adaptor Type: Norsonic Type 1443
Other:

**Adjustments:** Unit was not adjusted.

**Comments:** The instrument was tested and met all specifications found in the referenced procedures.

Note: The instrument was tested for the parameters listed in the table above, using the test methods described in the listed standards. All tests were performed around the reference conditions. The test results were compared with the manufacturer's or with the standard's specifications, whichever are larger.

Compliance with any standard cannot be claimed based solely on the periodic tests.

**Measured Data:** In Acoustical Calibrator Test Report # 39929 of one page.

**Place of Calibration:** Scantek, Inc.

6430 Dobbin Road, Suite C  
 Columbia, MD 21045 USA

Ph/Fax: 410-290-7726/ -9167  
[callab@scantekinc.com](mailto:callab@scantekinc.com)

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## Appendix B CPV Towantic Energy Center Project Facility Operation Far-Field Sound Test Protocol (10/18/2017)

### General

Gemma Power Systems, LLC (GPS) has designed and constructed the new CPV Towantic Energy Center in Oxford, CT. This 2x1 combined cycle natural gas-fired electrical generating facility is nominally rated at 805 MWe. Major equipment items at the facility include:

- Two (2) General Electric 7HA.01 combustion turbine generators (CTGs)
- Two (2) CMI Heat Recovery Steam Generators (HRSGs) with supplementary firing
- One (1) GE D602 Steam Turbine Generator (STG)
- Boiler Feed Pumps
- Fin Fan Coolers
- Air-Cooled Condenser
- Fuel Gas Compressors
- Generator Step-up Transformers
- Support Equipment

The references listed below identify the Far Field Noise Limits and associated Noise Receptor Locations for this project; pertinent sections from these references are presented the Appendix of this protocol.

The Owner or the Owner's representative shall be present for all far field noise testing at the Owner's discretion.

### Purpose

The purpose of this protocol is to describe in detail the sound measurements that will be made to demonstrate compliance of the power facility with the Far Field Noise Limits.

### Far Field Noise Limits

Sound levels produced by baseload operation of the Power Island Equipment Trains and Balance of Plant Systems will not exceed the values listed below in Table 1 for four far-field locations.

**Table 1: Far Field Noise Limits**

Noise Receptor ID	Noise Receptor Location/Description	A-Weighted Sound Level Limit (dBA) <sup>2</sup>
RES-N	Residential Land Boundary - North	51
RES-S	Residential Land Boundary - South	51
RES-E	Residential Land Boundary - East	51
PL-E	Industrial Property Line East of Site	70

Notes:

<sup>1</sup>Locations of the Noise Receptor Points are identified in Figure 1

<sup>2</sup>Plant sound only (i.e., excludes contribution of all non-plant ambient sounds)

### **Operating Survey**

1. Confirm the siting of the four far field measurement locations shown in Figure 1 with the Project Representative.
2. Confirm with Project Representative that the plant is operating at a nominal 50F Baseload Unfired operating condition. If gas compression is not required, due to sufficient pipeline pressure, a single gas compressor will be placed in in recirculation mode. Sound levels will be measured with the new generation plant in normal operation at a load of 90% capacity or greater. Maintain contact during survey to reconfirm plant condition.
3. Perform field calibration of instruments before commencement of the operating measurements.
4. Measure the overall A-weighted  $L_{90}$  sound levels for a five-minute period at each far field location. Should additional time be deemed useful by the field team to capture representative sound data at a location, the team may extend the measurement period at that location. For informational purposes, measure the unweighted  $L_{90}$  one-third octave band sound pressure levels in the frequency bands centered from 25 Hz to 12,500 Hz, plus the associated  $L_1$ ,  $L_{10}$ ,  $L_{50}$ , and  $L_{eq}$  A-weighted sound levels and one-third octave band sound pressure levels for the same five (5) minute period at each location. A measurement may be paused when the sound level is unduly influenced by a short-term non-plant sound event (e.g., local truck traffic), however, a minimum of five (5) minutes of data will be collected at each location.
5. Microphone will be fitted with the manufacturer's recommended windscreen, tripod-mounted about five (5) feet above the ground, and where practical, removed from any large, vertical reflective surface. The meter will be set with the fast time constant. Local weather conditions, including wind speed and direction, temperature, cloud cover, and any precipitation will be noted. In addition, the field team will note sounds from the facility or other sources observed at each location.
6. If the measured level exceeds the project limit levels at a location due to the contribution of non-plant sounds, then additional measurements shall be conducted at an alternate location closer to the facility and/or at other times when the contributions of non-plant sounds are reduced. An alternative location shall be in the same direction from the facility as the far field measurement location, but closer to the facility. The operating noise at the far field measurement location shall then be calculated from the level observed at the alternative location by subtracting hemispherical divergence and atmospheric absorption as listed in column 4 of Table 5.1 of the "Electric Power Plant Environmental Noise Guide", 1984 Edition. Distances used in the adjustment for hemispherical divergence shall be from the center of the closest major facility noise source that is clearly audible at the alternative measurement location. As an alternative, measure the ambient sound level with the plant turned off and subtract this value from the above sound level with the plant in operation in order to calculate the sound level of the facility. At each measurement location the test team will observe and describe the non-plant ambient sound sources and will estimate their contribution to the measured total sound level.
7. Perform field calibration of instruments following the conclusion of the operating measurements.

### **Determination of Compliance**

If the resultant overall A-weighted sound level (dBA) does not exceed the "Far Field Noise Limits" in Table 1, then the Plant Generated Noise is deemed in compliance at that location.

### **Plant Operating Conditions**

Sound levels will be measured with the power facility in normal baseload unfired operation at a load of 90% capacity or greater.

## **Weather Conditions**

The community measurements will be performed during the normal operating time of the plant during times of acceptable weather conditions, including relatively calm winds (e.g., winds less than 10 mph) and no precipitation. Weather conditions, including air temperature, wind speed and direction, and cloud cover will be noted during the survey. Measurements will not be taken if there is significant freshly-fallen snow on the ground.

## **Instrumentation**

All direct measurements will be made with a precision sound level meter that nominally meets the Type 1 provisions in ANSI S1.4-1983, ANSI S1.11-2004, and ANSI S1.43-1997; and/or meet the Class 1 provisions in IEC 61672-1: 2002 and IEC 61260: 1995. All sound measurement instrumentation will be identified as to manufacturer and model. Additional information, including instrument serial number and date of most recent laboratory calibration will be kept on file. All instrumentation shall have been calibrated in the lab within the previous 24 months with its calibration traceable to NIST. The instrumentation will also be calibrated in the field prior to and following the series of measurements and any test series shall be repeated if the before-and-after calibration level change exceeds  $\pm 1.0$  dB.

## **Personnel**

The survey will be performed by a qualified acoustical consultant or engineer who will employ methods that generally conform to the ASME PTC 36 standard and applicable ANSI and ASTM standards for the measurement of sound.

## **Schedule**

The survey will be scheduled for a time with appropriate plant operating conditions, suitable weather conditions, and available instrumentation and personnel. The compliance measurements can be obtained during the day or night. If, in the judgment of the field team, high background ambient sound levels during a test period preclude useful measurements, the team may reschedule measurements to another time.

## **Reporting**

A report that summarizes the pertinent results of the above operating survey will be prepared and submitted within two weeks from completion of the survey. The report should include the following information, at a minimum:

1. An introduction with a discussion of the background behind the measurement program.
2. A review of the test set-up information. This includes details regarding the test personnel, the meteorological conditions, the plant layout and measurement locations, and the test equipment.
3. An explanation of the measurement methodologies/techniques used to acquire the sound level data including observations and descriptions of the non-plant ambient sound sources and their estimated contribution to the measured total sound level.
4. A thorough presentation of the measured sound level data including explanatory and/or summary graphics, tables, or charts; per measurement location.
5. Calibration documentation performed on test instruments before, during, or after the testing.
6. A summary discussion relating the measured results to the generation project sound level limits.

## **References**

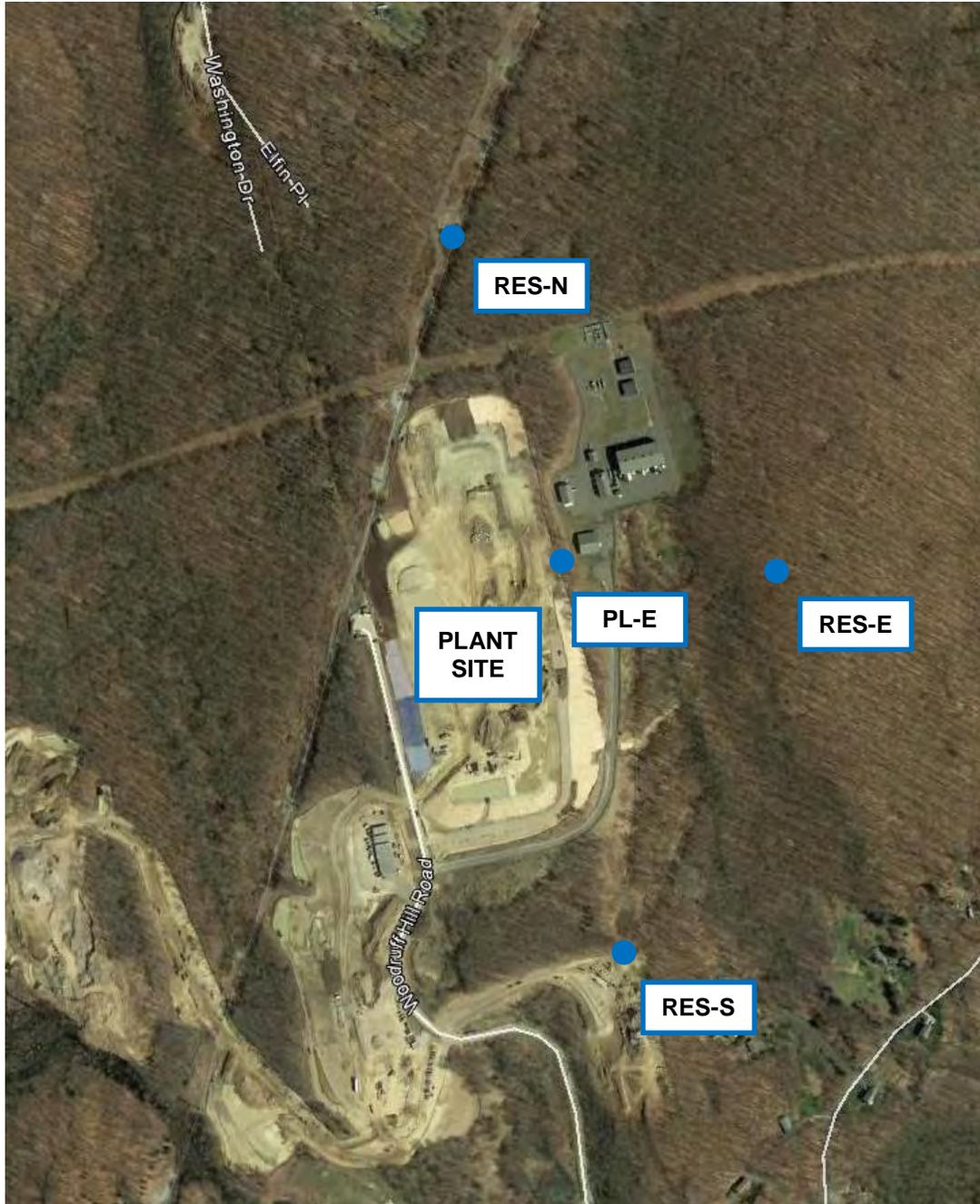
Figure 1 - Aerial Photo of CPV Towantic Energy Center Site.

Figure 2 - Far-Field Sound Measurement Locations RES-N, RES-S, RES-E, and PL-E.  
(from Exhibit A: Appendix Q – Noise Report for Project)

EPC Exhibit K: Limits and Performance Tests for CPV Towantic Energy Center Project.

Exhibit A: Appendix Q – Noise Report for CPV Towantic Energy Center Project.

**Figure 1.**  
**Aerial Photo of CPV Towantic Energy Center Site and**  
**Far Field Noise Receptor Locations RES-N, RES-S, RES-E, and PL-E.**



**Figure 2.**  
**Far-Field Sound Measurement Locations RES-N, RES-S, RES-E, and PL-E.**  
**(from Exhibit A: Appendix Q – Noise Report for Project)**

