IES ENGINEERS

1720 Walton Road Blue Bell, PA 19422 610-828-3078 Fax 610-828-7842

March 29, 2013

HAND DELIVER
Mr. Raymond Kempa, P.E.
Environmental Engineer Manager -- New Source Review
Pennsylvania Department of Environmental Protection
2 Public Square
Wilkes-Barre, PA 18711

MAR 29 2013

Subject: Plan Approval Application
Confidential Version
Energy Production Facility
Delta Thermo Energy A, LLC
Allentown, Pennsylvania
IES Project No. EV120894.04

Dear Mr. Kempa:

On behalf of Delta Thermo Energy A, LLC (DTE), IES Engineers (IES) is pleased to submit an original and two copies of the enclosed Plan Approval Application (including a CD containing the results of the confidential Dispersion Modeling Analysis) for the operation of a commercial-scale Energy Production facility. The facility will produce fuel from municipal solid waste (MSW) and sludge from the City of Allentown Waste Water Treatment Plant to generate electricity for internal use and sale to the electric grid. The facility will be located at 112 Union Street, Allentown, Lehigh County.

Please note that the enclosed application contains proprietary information, trade secrets, and intellectual property rights. Release of this information to a third party could jeopardize DTE's competitive position in the industry. We request that the Department safeguard the confidential information in this application pursuant to 25 Pa. Code §127.12(d) of the Department's Air Resources Regulations. Accordingly, we are enclosing two separate plan approval applications. One is marked **"Public"** and contains only general information and emission data. The other application is marked **"Confidential"** and should not be disclosed or made publicly available. In addition to the protections provided by 25 Pa. Code Section 127.12(d), the application should be considered exempt from public disclosure under Section 708(b)(11) of the Pennsylvania Right-to-Know Law. Under the Right-to-Know Law, the application marked **"Confidential"** should not be considered a public record because it would reveal trade secrets or other confidential proprietary information.

On September 24, 2010, DTE submitted a Request for Determination of Requirement for Plan Approval/Operating Permit (RFD) to construct a research & development energy production facility. On October 14, 2010, the Department approved this RFD (No. 1737), authorizing construction and operation of the facility. In the intervening period, the facility fundamental

design has been finalized, allowing DTE to operate it on a full-scale, commercial basis, rather than only on a research & development basis. The emissions of all pollutants from the full-scale facility will be of the same magnitude allowed in the RFD, and, with the incorporation of appropriate emission control devices, will be significantly less than the thresholds for research and development facilities published in the Department's current plan approval exemption listing, dated July 26, 2003. Accordingly, DTE believes that construction of the facility can be initiated under the approved RFD, prior to issuance of the plan approval.

We have enclosed a check in the amount of $1,000, payable to the "Commonwealth of Pennsylvania, Clean Air Fund" fee for the Department's processing of this application.

Should you have any questions concerning this request, please do not hesitate to contact me or Mr. Robert Van Naarden of DTE at (215) 809-1139.

Very truly yours,

Robert W. Schlosser, P.E.
Principal Project Manager

Enclosure
cc: R. Van Naarden, DTE
M. Bonilla, DTE
J. Bolstein, Fox Rothschild
A. Soni, IES

1194

DELTA THERMO ENERGY INC
1210 NORTHBROOK DRIVE SUITE 100
TREVOSE, PA 19053-8408

55-7265-212

DATE March 28, 2013

Pay to the order of Commonwealth of Pennsylvania, Clean Air Fund $ 1,000.xx/100

One Thousand and xx/100 DOLLARS

Security Features Included. Details on Back.

citibank
CITIBANK, N.A. BR #773
2118 COTTMAN AVENUE
PHILADELPHIA, PA 19149

FOR Air Plan App Submission/LES

Robert Van Naard

⑈001194⑈ ⑆021272655⑆ 7594666658⑈

CONFIDENTIAL VERSION

1720 Walton Road Blue Bell, PA 19422 610-828-3078 Fax 610-828-7842

PLAN APPROVAL APPLICATION
FOR AN
ENERGY PRODUCTION FACILITY

ALLENTOWN, PENNSYLVANIA

SUBMITTED BY:

DELTA THERMO ENERGY A, LLC
1210 NORTHBROOK DRIVE, SUITE 100
TREVOSE, PENNSYLVANIA 19053

SUBMITTED TO:

AIR QUALITY PROGRAM
PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST REGIONAL OFFICE
WILKES-BARRE, PENNSYLVANIA 18711

MARCH 2013
IES PROJECT NO. EV120894.04

TABLE OF CONTENTS

ATTACHMENTS

GENERAL INFORMATION FORM

1300-PM-BIT0001 5/2012
Form

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

MAR 29 2013

GENERAL INFORMATION FORM – AUTHORIZATION APPLICATION

Before completing this General Information Form (GIF), read the step-by-step instructions provided in this application package. This version of the General Information Form (GIF) must be completed and returned with any program-specific application being submitted to the Department.

Related ID#s (If Known)				DEP USE ONLY
Client ID#	300555	APS ID#		Date Received & General Notes
Site ID#		Auth ID#		
Facility ID#	767998			

CLIENT INFORMATION

DEP Client ID#	Client Type / Code
300555	NPACO

Organization Name or Registered Fictitious Name	Employer ID# (EIN)	Dun & Bradstreet ID#
Delta Thermo Energy A, LLC	80-0494550	

Individual Last Name	First Name	MI	Suffix	SSN
Van Naarden	Robert			
Additional Individual Last Name	**First Name**	**MI**	**Suffix**	**SSN**

Mailing Address Line 1	Mailing Address Line 2
One Northbrook Dr. 1210 Northbrook Corp. Center, Ste 100	

Address Last Line – City	State	ZIP+4	Country
Trevose	PA	19053	USA

Client Contact Last Name	First Name	MI	Suffix
Van Naarden	Robert		

Client Contact Title	Phone	Ext
CEO, Delta Thermo Energy A, LLC	215-809-1139	

Email Address	FAX
rvannaarden@deltathermo.com	215-809-1140

SITE INFORMATION

DEP Site ID#	Site Name
	Delta Thermo Energy, A, LLC - Allentown Energy Production Facility

EPA ID#	Estimated Number of Employees to be Present at Site	21

Description of Site
To produce commercial quantities of renewable clean fuel and electricity as well as recyclable materials.

County Name	Municipality	City	Boro	Twp	State
Lehigh	Allentown	☒	☐	☐	
County Name	**Municipality**	**City**	**Boro**	**Twp**	**State**
		☐	☐	☐	

Site Location Line 1	Site Location Line 2
112 West Union Street	

Site Location Last Line – City	State	ZIP+4
Allentown	PA	18102

Detailed Written Directions to Site
From Rt. 22, take exit for Mac Arthur Road South (Rt 145). Rt 145 will turn into 7th Street. Travel approximately 2 miles and turn left onto West Union Street. Travel approximately 0.8 miles, site will be on your right.

Site Contact Last Name	First Name	MI	Suffix
Van Naarden	Robert		

Site Contact Title	Site Contact Firm
CEO	Delta Thermo Energy A, LLC

Mailing Address Line 1	Mailing Address Line 2
One Northbrook Dr., 1210 Northbrook Corp. Center, Ste 100	

Mailing Address Last Line – City			State	ZIP+4
Trevose			PA	19053
Phone	**Ext**	**FAX**	**Email Address**	
215-809-1139		215-809-1140	rvannaarden@deltathermo.com	

NAICS Codes (Two- & Three-Digit Codes – List All That Apply) **6-Digit Code** (Optional)
562213

Client to Site Relationship
LESOP

FACILITY INFORMATION

Modification of Existing Facility **Yes** **No**

1. **Will this project modify an existing facility, system, or activity?** ☐ ☒
2. **Will this project involve an addition to an existing facility, system, or activity?** ☐ ☒

If "Yes", check all relevant facility types and provide DEP facility identification numbers below.

	Facility Type	DEP Fac ID#		Facility Type	DEP Fac ID#
☒	Air Emission Plant		☐	Industrial Minerals Mining Operation	
☐	Beneficial Use (water)		☐	Laboratory Location	
☐	Blasting Operation		☐	Land Recycling Cleanup Location	
☐	Captive Hazardous Waste Operation		☐	MineDrainageTrmt/LandRecyProjLocation	
☐	Coal Ash Beneficial Use Operation		☒	Municipal Waste Operation	
☐	Coal Mining Operation		☐	Oil & Gas Encroachment Location	
☐	Coal Pillar Location		☐	Oil & Gas Location	
☐	Commercial Hazardous Waste Operation		☐	Oil & Gas Water Poll Control Facility	
☐	Dam Location		☐	Public Water Supply System	
☐	Deep Mine Safety Operation -Anthracite		☐	Radiation Facility	
☐	Deep Mine Safety Operation -Bituminous		☐	Residual Waste Operation	
☐	Deep Mine Safety Operation -Ind Minerals		☐	Storage Tank Location	
☐	Encroachment Location (water, wetland)		☐	Water Pollution Control Facility	
☒	Erosion & Sediment Control Facility		☐	Water Resource	
☐	Explosive Storage Location		☐	Other:	

Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
CNTR	40	36	17	75	27	26

Horizontal Accuracy Measure Feet 1 --or-- Meters

Horizontal Reference Datum Code
- ☐ North American Datum of 1927
- ☐ North American Datum of 1983
- ☒ World Geodetic System of 1984

Horizontal Collection Method Code EMAP

Reference Point Code CNTR

Altitude Feet 260 --or-- Meters

Altitude Datum Name
- ☐ The National Geodetic Vertical Datum of 1929
- ☒ The North American Vertical Datum of 1988 (NAVD88)

Altitude (Vertical) Location Datum Collection Method Code TOPO

Geometric Type Code

Data Collection Date

Source Map Scale Number Inch(es) = Feet

--or-- Centimeter(s) = Meters

PROJECT INFORMATION

Project Name
Allentown Energy Production Facility

Project Description
To obtain plan approval for energy production facility

Project Consultant Last Name	First Name	MI	Suffix
Schlosser	Robert	W	

Project Consultant Title	Consulting Firm
Principal Project Manager	IES Engineers

Mailing Address Line 1	Mailing Address Line 2
1720 Walton Road	

Address Last Line – City		State	ZIP+4
Blue Bell		PA	19422
Phone	**Ext** **FAX**	**Email Address**	
610-828-3078	610-828-7842	rschlosser@iesengineers.com	

Time Schedules	Project Milestone (Optional)
	DTE can initiate construction of the energy production facility under the approved RFD, but will not operate it for commercial purposes until the plan approval is issued.

1. **Have you informed the surrounding community and addressed any concerns prior to submitting the application to the Department?** ☒ Yes ☐ No

2. **Is your project funded by state or federal grants?** ☒ Yes ☐ No
   Note: If "Yes", specify what aspect of the project is related to the grant and provide the grant source, contact person and grant expiration date.
   Aspect of Project Related to Grant
   Grant Source: 1. RACP Commonwealth Grant ($2.5MM); 2. CFA Commonwealth Grant ($2MM); 3. DOE Federal Grant ($1MM); and 4. PEDA Commonwealth Grant ($0.5MM)
   Grant Contact Person: See table below
   Grant Expiration Date: See table below

3. **Is this application for an authorization on Appendix A of the Land Use Policy? (For referenced list, see Appendix A of the Land Use Policy attached to GIF instructions)** ☐ Yes ☐ No
   Note: If "No" to Question 3, the application is not subject to the Land Use Policy.
   If "Yes" to Question 3, the application is subject to this policy and the Applicant should answer the additional questions in the **Land Use Information** section.

LAND USE INFORMATION

Note: Applicants are encouraged to submit copies of local land use approvals or other evidence of compliance with local comprehensive plans and zoning ordinances.

1. **Is there an adopted county or multi-county comprehensive plan?** ☒ Yes ☐ No
2. **Is there an adopted municipal or multi-municipal comprehensive plan?** ☒ Yes ☐ No
3. **Is there an adopted county-wide zoning ordinance, municipal zoning ordinance or joint municipal zoning ordinance?** ☒ Yes ☐ No
   Note: If the Applicant answers "No" to either Questions 1, 2 or 3, the provisions of the PA MPC are not applicable and the Applicant does not need to respond to questions 4 and 5 below.
   If the Applicant answers "Yes" to questions 1, 2 and 3, the Applicant should respond to questions 4 and 5 below.
4. **Does the proposed project meet the provisions of the zoning ordinance or does the proposed project have zoning approval?** If zoning approval has been received, attach documentation. ☒ Yes ☐ No
5. **Have you attached Municipal and County Land Use Letters for the project?** ☒ Yes ☐ No

Grant	Contact	Expiration Date
RACP	Elias Joseph	11/30/15
CFA	ra-dcedcbf@pa.gov	6/30/13
DOE	Will Schrode	3/31/13
PEDA	Bharat N. Bham	10/1/14

COORDINATION INFORMATION

Note: The PA Historical and Museum Commission must be notified of proposed projects in accordance with DEP Technical Guidance Document 012-0700-001 and the accompanying Cultural Resource Notice Form.

If the activity will be a mining project (i.e., mining of coal or industrial minerals, coal refuse disposal and/or the operation of a coal or industrial minerals preparation/processing facility), respond to questions 1.0 through 2.5 below.

If the activity will not be a mining project, skip questions 1.0 through 2.5 and begin with question 3.0.

1.0	**Is this a coal mining project?** If "Yes", respond to 1.1-1.6. If "No", skip to Question 2.0.	☐	Yes	☒	No
1.1	**Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be equal to or greater than 200 tons/day?**	☐	Yes	☐	No
1.2	**Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be greater than 50,000 tons/year?**	☐	Yes	☐	No
1.3	**Will this coal mining project involve coal preparation/ processing activities in which thermal coal dryers or pneumatic coal cleaners will be used?**	☐	Yes	☐	No
1.4	**For this coal mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?**	☐	Yes	☐	No
1.5	**Will this coal mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?**	☐	Yes	☐	No
1.6	**Will this coal mining project involve underground coal mining to be conducted within 500 feet of an oil or gas well?**	☐	Yes	☐	No
2.0	**Is this a non-coal (industrial minerals) mining project?** If "Yes", respond to 2.1-2.6. If "No", skip to Question 3.0.	☐	Yes	☒	No
2.1	**Will this non-coal (industrial minerals) mining project involve the crushing and screening of non-coal minerals other than sand and gravel?**	☐	Yes	☐	No
2.2	**Will this non-coal (industrial minerals) mining project involve the crushing and/or screening of sand and gravel with the exception of wet sand and gravel operations (screening only) and dry sand and gravel operations with a capacity of less than 150 tons/hour of unconsolidated materials?**	☐	Yes	☐	No
2.3	**Will this non-coal (industrial minerals) mining project involve the construction, operation and/or modification of a portable non-metallic (i.e., non-coal) minerals processing plant under the authority of the General Permit for Portable Non-metallic Mineral Processing Plants (i.e., BAQ-PGPA/GP-3)?**	☐	Yes	☐	No
2.4	**For this non-coal (industrial minerals) mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?**	☐	Yes	☐	No
2.5	**Will this non-coal (industrial minerals) mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?**	☐	Yes	☐	No

3.0	**Will your project, activity, or authorization have anything to do with a well related to oil or gas production, have construction within 200 feet of, affect an oil or gas well, involve the waste from such a well, or string power lines above an oil or gas well?** If "Yes", respond to 3.1-3.3. If "No", skip to Question 4.0.	☐	Yes	☒	No
3.1	**Does the oil- or gas-related project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water (including wetlands)?**	☐	Yes	☐	No
3.2	**Will the oil- or gas-related project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system or storm water system?** If "Yes", discuss in *Project Description*.	☐	Yes	☐	No
3.3	**Will the oil- or gas-related project involve the construction and operation of industrial waste treatment facilities?**	☐	Yes	☐	No
4.0	**Will the project involve a construction activity that results in earth disturbance?** If "Yes", specify the total disturbed acreage. **4.0.1 Total Disturbed Acreage** 4.09 acres	☒	Yes	☐	No
5.0	**Does the project involve any of the following?** If "Yes", respond to 5.1-5.3. If "No", skip to Question 6.0.	☐	Yes	☒	No
5.1	**Water Obstruction and Encroachment Projects – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water?**	☐	Yes	☒	No
5.2	**Wetland Impacts – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a wetland?**	☐	Yes	☐	No
5.3	**Floodplain Projects by the commonwealth, a Political Subdivision of the commonwealth or a Public Utility – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a floodplain?**	☐	Yes	☐	No
6.0	**Will the project involve discharge of stormwater or wastewater from an industrial activity to a dry swale, surface water, ground water or an existing sanitary sewer system or separate storm water system?**	☒	Yes	☐	No
7.0	**Will the project involve the construction and operation of industrial waste treatment facilities?**	☒	Yes	☐	No
8.0	**Will the project involve construction of sewage treatment facilities, sanitary sewers, or sewage pumping stations?** If "Yes", indicate estimated proposed flow (gal/day). Also, discuss the sanitary sewer pipe sizes and the number of pumping stations/treatment facilities/name of downstream sewage facilities in the *Project Description*, where applicable. **8.0.1 Estimated Proposed Flow (gal/day)**	☐	Yes	☒	No
9.0	**Will the project involve the subdivision of land, or the generation of 800 gpd or more of sewage on an existing parcel of land or the generation of an additional 400 gpd of sewage on an already-developed parcel, or the generation of 800 gpd or more of industrial wastewater that would be discharged to an existing sanitary sewer system?**	☐	Yes	☒	No
	9.0.1 Was Act 537 sewage facilities planning submitted and approved by DEP? If "Yes" attach the approval letter. Approval required prior to 105/NPDES approval.	☐	Yes	☒	No
10.0	**Is this project for the beneficial use of biosolids for land application within Pennsylvania?** If "Yes" indicate how much (i.e. gallons or dry tons per year). **10.0.1 Gallons Per Year (residential septage)** _____ **10.0.2 Dry Tons Per Year (biosolids)**	☐	Yes	☒	No
11.0	**Does the project involve construction, modification or removal of a dam?** If "Yes", identify the dam. **11.0.1 Dam Name**	☐	Yes	☒	No

12.0	**Will the project interfere with the flow from, or otherwise impact, a dam?** If "Yes", identify the dam.	☐	Yes	☒	No
	12.0.1 Dam Name				
13.0	**Will the project involve operations (excluding during the construction period) that produce air emissions (i.e., NOX, VOC, etc.)?** If "Yes", identify each type of emission followed by the amount of that emission.	☒	Yes	☐	No
	13.0.1 Enter all types & amounts of emissions; separate each set with semicolons. SEE ATTACHMENT 3				
14.0	**Does the project include the construction or modification of a drinking water supply to serve 15 or more connections or 25 or more people, at least 60 days out of the year?** If "Yes", check all proposed sub-facilities.	☐	Yes	☒	No
	14.0.1 Number of Persons Served				
	14.0.2 Number of Employee/Guests				
	14.0.3 Number of Connections				
	14.0.4 Sub-Fac: Distribution System	☐	Yes	☐	No
	14.0.5 Sub-Fac: Water Treatment Plant	☐	Yes	☐	No
	14.0.6 Sub-Fac: Source	☐	Yes	☐	No
	14.0.7 Sub-Fac: Pump Station	☐	Yes	☐	No
	14.0.8 Sub Fac: Transmission Main	☐	Yes	☐	No
	14.0.9 Sub-Fac: Storage Facility	☐	Yes	☐	No
15.0	**Will your project include infiltration of storm water or waste water to ground water within one-half mile of a public water supply well, spring or infiltration gallery?**	☐	Yes	☒	No
16.0	**Is your project to be served by an existing public water supply?** If "Yes", indicate name of supplier and attach letter from supplier stating that it will serve the project.	☒	Yes	☐	No
	16.0.1 Supplier's Name City of Allentown				
	16.0.2 Letter of Approval from Supplier is Attached	☐	Yes	☒	No
17.0	**Will this project involve a new or increased drinking water withdrawal from a stream or other water body?** If "Yes", should reference both Water Supply and Watershed Management.	☐	Yes	☒	No
	17.0.1 Stream Name				
18.0	**Will the construction or operation of this project involve treatment, storage, reuse, or disposal of waste?** If "Yes", indicate what type (i.e., hazardous, municipal (including infectious & chemotherapeutic), residual) and the amount to be treated, stored, re-used or disposed.	☒	Yes	☐	No
	18.0.1 Type & Amount				
19.0	**Will your project involve the removal of coal, minerals, etc. as part of any earth disturbance activities?**	☐	Yes	☒	No
20.0	**Does your project involve installation of a field constructed underground storage tank?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit.	☐	Yes	☒	No
	20.0.1 Enter all substances & capacity of each; separate each set with semicolons.				
21.0	**Does your project involve installation of an aboveground storage tank greater than 21,000 gallons capacity at an existing facility?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit.	☐	Yes	☒	No
	21.0.1 Enter all substances & capacity of each; separate each set with semicolons.				

22.0	**Does your project involve installation of a tank greater than 1,100 gallons which will contain a highly hazardous substance as defined in DEP's Regulated Substances List, 2570-BK-DEP2724?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. **22.0.1 Enter all substances & capacity of each; separate each set with semicolons.**	☐	Yes	☒	No
23.0	**Does your project involve installation of a storage tank at a new facility with a total AST capacity greater than 21,000 gallons?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. **23.0.1 Enter all substances & capacity of each; separate each set with semicolons.**	☐	Yes	☒	No
24.0	**Will the intended activity involve the use of a radiation source?**	☐	Yes	☒	No

CERTIFICATION

I certify that I have the authority to submit this application on behalf of the applicant named herein and that the information provided in this application is true and correct to the best of my knowledge and information.

Type or Print Name Robert W. Schlosser, P.E.

Signature	Title	Date
	Principal Project Manager	3/27/13

PLAN APPROVAL APPLICATION FORM

2700-PM-AQ0021 Rev. 6/2004

CONFIDENTIAL

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

ubmit in Triplicate

MAR 29 2013

COMBUSTION UNIT

Application for Plan Approval to Construct, Modify or Reactivate an Air Contamination Source and/or Install an Air Cleaning Device

This application and the General Information Form (GIF) must be included in the submittal

Before completing this form, read the instructions provided with this form.

Section A - Facility Name, Checklist and Certification

Organization Name or Registered Fictitious Name/Facility Name: Delta Thermo Energy A, LLC

DEP Client ID# (If Known): 300555

Type of Review required and Fees:

Source which is not subject to NSPS, NESHAPs, MACT, NSR and PSD:..... $1,000
Source requiring approval under NSPS or NESHAPS or both: ..... $
Source requiring approval under NSR: ..... $
Source requiring the establishment of a MACT limitation: ..... $
Source requiring approval under PSD: ..... $

Applicant's Checklist

Check the following list to make sure that all the required documents are included.

General Information Form (GIF)

Combustion Unit Plan Approval Application

Compliance Review Form or provide reference of most recently submitted compliance review form for facilities submitting on a periodic basis: _____

Proof of County and Municipal Notifications

Permit Fees

Addendum A: Source Applicable Requirements (only applicable to existing Title V facility)

Certification of Truth, Accuracy and Completeness by a Responsible Official

I, **Robert Van Naarden**, certify under penalty of law in 18 Pa. C. S. A. §4904, and 35 P.S. §4009(b) (2) that based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate and complete.

(Signature): Robert Van Naard Date: 3/28/13

Name (Print): Robert Van Naarden Title: CEO

OFFICIAL USE ONLY

Application No. _____ Unit ID _____ Site ID _____
DEP Client ID #: _____ APS. ID _____ AUTH. ID _____
Date Received _____ Date Assigned _____ Reviewed By _____
Date of 1st Technical Deficiency _____ Date of 2nd Technical Deficiency _____
Comments: _____

Section B - Combustion Unit Information

1. Combustion Units: ☐ Coal ☐ Oil ☒ Natural Gas (Startup Only) Other: Pulverized Fuel Product produced from municipal solid waste and sewage sludge

Description: Complete Combustion Chamber (CCC)

Manufacturer	Model No.	Number of units
Jasper (or equal)	Jasper (or equal)	1

Maximum heat input (Btu/hr)	Rated heat input (Btu/hr)	Typical heat input (Btu/hr)	Furnace Volume
76,280,000	76,280,000	76,280,000	

Grate Area (if applicable)	Method of firing

Indicate how combustion air is supplied to boiler

Indicate the Steam Usage:

Mark and describe soot Cleaning Method: - N/A

i. Air Blown
ii. Steam Blown
iii. Brushed and Vacuumed
iv. Other _____
v. Frequency of Cleaning _____

Maximum Operating schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	7	320	7,680

Operational restrictions taken or requested, if any (e.g., bottlenecks or voluntary restrictions to limit potential to emit)

Capacity (specify units)

Per hour	Per day	Per week	Per year
4.954 ton/hr PF	118.9 ton/day PF	832.3 ton/wk PF	38.047 ton/yr PF

Typical Operating schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	7	320	7,680

Seasonal variations (Months): If variations exist, describe them.

Operating using primary fuel: _____ From _____ to _____
Operating using secondary fuel: _____ Form _____ to _____
Non-operating: From _____ to _____

2. Specify the primary, secondary and startup fuel. Furnish the details in item 3.

Pulverized fuel produced from municipal solid waste and sewage sludge in the RRS is burned in the CCC. The CCC is equipped with a 1.1 MMBTU/hr natural gas-fired burner for startup. Startup time is estimated to require 8 hours and occur 3 times per year.

Section B - Combustion Unit Information (Continued)

3. Fuel

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas Pipeline	1,079 SCFH	25,896 SCFH/year	gr/100 SCF		1,020 Btu/SCF
Gas (other)	SCFH	X 10^6 Gal	gr/100 SCF		Btu/SCF
Coal					
Other* Pulverized Fuel	4.954 ton/hr	38,047 ton/yr		11.4	9,038 BTU/lb

* Note: Describe and furnish information separately for other fuels in Addendum B.

4. Burner

Manufacturer	Model Number	Type of Atomization (Steam, air, press, mech., rotary cup)
Custom	TBD	

Number of Burners	Maximum fuel firing rate (all burners)	Normal fuel firing rate

If oil, temperature and viscosity.

Maximum theoretical air requirement

Percent excess air 100% rating

Turndown ratio

Combustion modulation control (on/off, low-high fire, full automatic, manual). Describe.

Main burner flame ignition method (electric spark, auto gas pilot, hand-held torch, other). Describe.

5. Nitrogen Oxides (NO_x) control Options

Mark and describe the NO_x control options adopted

Low excess air (LEA)	**Flue gas recirculation**	Other **SCR with ammonia injection**
Over fire air (OFA)	Burner out of service	
Low-NO_x burner	Reburning	
Low NO_x burners with over fire air	Flue gas treatment (SCR / SNCR)	

Section B - Combustion Unit Information (Continued)

3. Miscellaneous Information

Describe fly ash reinjection operation
N/A

Describe, in detail, the equipment provided to monitor and to record the source(s) operating conditions, which may affect emissions of air contaminants. Show that they are reasonable and adequate.

See Attachment 7

Describe each proposed modification to an existing source.

N/A

Describe how emissions will be minimized especially during start up, shut down, combustion upsets and/or disruptions. Provide emission estimates for start up, shut down, and upset conditions. Provide duration of start up and shut down.

Good combustion and engineering practices, operation and maintenance in accordance with manufacturer recommendations, and the use of clean fuel (natural gas) during startup.

Describe in detail with a schematic diagram of the control options adopted for SO_2 (if applicable).
See Attachment 2 and Figure 2-1.

Anticipated milestones:

Expected commencement date of construction/reconstruction: _____
Expected completion date of construction/reconstruction: _____
Anticipated date(s) of start-up: _____

Section C - Air Cleaning Device

1. **Precontrol Emissions*** ***See Attachment 3***

Emission Rate

Pollutant	Maximum Emission Rate				Calculation/ Estimation Method
	Specify Units	Pounds/Hour	Hours/Year	Tons/Year	
PM					
PM_{10}					
SOx					
CO					
NO_x					
VOC					
Others: (e.g., HAPs)	-----	-----	-----		-----

* These emissions must be calculated based on the requested operating schedule and/or process rate, e.g., operating schedule for maximum limits or restricted hours of operation and/or restricted throughput. Describe how the emission values were determined. Attach calculations.

2. **Gas Conditioning**

Water quenching ☒ YES ☐ NO Water injection rate 12 GPM

Radiation and convection cooling ☐ YES ☒ NO

Air dilution ☐ YES ☒ NO
If YES, _____ CFM

Forced draft ☐ YES ☒ NO

Water cooled duct work ☐ YES ☒ NO

Other _____

Inlet volume
41,767 ACFM @ 320 °F

Outlet volume
34,226 ACFM @ 135°F 17.3 % Moisture

Describe the system in detail.
See Attachment 2

Section C - Air Cleaning Device (Continued)

3. Inertial and Cyclone Collectors --

Manufacturer	Type	Model No.
Ducon (or equal)	Twin Cyclone	810, Size 2-635

Pressure Drop (in. of water)	Inlet Volume	Outlet Volume
5	56,760 ACFM @ 600 °F	56,700 ACFM @ 600 °F 11.4 % Moisture

Number of Individual Cyclone(s) 2	Outlet Straightening Vanes Used? ☐ Yes ☒ No

Length of Cyclone(s) Cylinder (ft)	Diameter of Cyclone(s) Cylinder	Length of cyclone(s) cone (ft)
91.5 inches	72 inches	See Attachment 2

Inlet Diameter (ft) or Duct Area (ft^2) of Cyclone(s)	Outlet Diameter (ft) or Duct area (ft^2) of cyclone(s)
45¾ inches x 45¾ inches	30.5 inches diameter

If a multi-clone or multi-tube unit is installed, will any of the individual cyclones or cyclone tubes be blanked or blocked off?

No

Describe any exhaust gas recirculation loop to be employed.

None

Attach particle size efficiency curve

See Attachment 2

Emission data -- See Attachment 3

Inlet	Outlet	Removal Efficiency (%)

Section C - Air Cleaning Device (Continued)

3. ☒ **SELECTIVE CATALYTIC REDUCTION (SCR)**
   ☐ **SELECTIVE NON-CATALYTIC REDUCTION (SNCR)**
   ☐ **NON-SELECTIVE CATALYTIC REDUCTION (NSCR)**

Equipment specifications

Manufacturer	Type	Model No
Ducon (or equal)	Reducing Catalyst	NR-90, Size 36

Design inlet volume (SCFM)	Design operating temperature (°F)
56,760 acfm @ 600 °F	600

Is the system equipped with process controls for proper mixing/control of the reducing agent in gas stream? If yes, give details.
No

Attach efficiency and other pertinent information (e.g., Ammonia, urea slip).
Ammonia slip = 5 ppm

Operating parameters

Volume of gases handled (ACFM) 56,760 @ 600 (°F)

Operating temperature range for the SCR/SNCR/NSCR system (°F)	From	To
	550 °F	650 °F

Reducing agent used, if any.	Oxidation catalyst used, if any.
Ammonia solution	None

State expected range of usage rate and concentration.
Urea usage = 3 lb/hr

Service life of catalyst	Ammonia slip (ppm)
2-3 years	5

Describe fully with a sketch giving locations of equipment, controls system, important parameters, and method of operation.
See Attachment 2

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements.
Loss of ammonia injection and high pressure drop will be alarmed

See Attachment 2.

Emissions data -- *See Attachment 3*

Pollutant	Inlet	Outlet	Removal Efficiency (%)

Section C - Air Cleaning Device (Continued)

L. Fabric Collector

Equipment Specifications

Manufacturer Ducon (or equal)	Model No. UNF-1, Size 64 (or equal)	☐ Pressurized Design ☒ Suction Design

Number of Compartments 1	Number of Filters Per Compartment 640	Is Baghouse Insulated? ☐ Yes ☒ No

Can each compartment be isolated for repairs and/or filter replacement? ☐ Yes ☐ No
N/A

Are temperature controls provided? (Describe in detail) ☒ Yes ☐ No
Process controls associated with operating the boiler

Dew point at maximum moisture 120 °F | Design inlet volume 28,380 SCFM

Type of Fabric
Material P84 ☐ Felted ☒ Membrane
Weight _____ oz/sq.yd ☐ Woven ☐ Others: List: _____
Thickness _____ in ☐ Felted-Woven

Fabric permeability (clean) @ ½" water-Δ P _____ CFM/sq.ft.

Filter dimensions 6" diameter x 14' length Diameter/Width 6" diameter

Effective area per filter: 22 each, or 14,080 SF (total) | Maximum operating temperature (°F) 450

Effective air to cloth ratio Minimum 3:1 Maximum _____

Drawing of Fabric Filter
A sketch of the fabric filter showing all access doors, catwalks, ladders, and exhaust ductwork, location of each pressure and temperature indicator should be attached. Will be provided upon completion of engineering

Operation and Cleaning

Volume of gases handled 41,767 ACFM 320 °F	Pressure drop across collector (in. of water). 4-6 inches w.g. Describe the equipment to be used to monitor the pressure drop.

Type of filter cleaning
☐ Manual Cleaning ☐ Bag Collapse ☐ Reverse Air Jets
☐ Mechanical Shakers ☐ Sonic Cleaning ☒ Other: Pulse jet
☐ Pneumatic Shakers ☐ Reverse Air Flow

If compressed air is required for collector operation, describe the equipment with the compressor to provide dry air free from oil. Compressor will be equipped with oil separator and desiccator to provide treated air

Cleaning Initiated By
☐ Timer Frequency if timer actuated _____
☒ Expected pressure drop range 4 to 6 in. of water ☐ Other Specify _____

Does air cleaning device employ hopper heaters, hopper vibrators, or hopper level detectors? If yes, describe.
No

Describe the warning/alarm system that protects against operation when the unit is not meeting design requirements.
High pressure drop alarm

Emissions Data -- *See Attachment 3*

Pollutant	Inlet	Outlet	Removal Efficiency (%)

Section C - Air Cleaning Device (Continued)

5. Wet Collection Equipment: Packed Column Scrubber

Equipment Specifications

Manufacturer	Type	Model No.
Ducon (or equal)	Vertical packed column	CAT, Size 96

Design Inlet Volume (SCFM)	Relative Particulate/Gas Velocity (ejector scrubbers only)
34,226 ACFM @ 135 °F	11.4 feet/second

Describe the internal features (e.g., variable throat, gas/liquid diffusion plates, spray nozzles, liquid redistributors, bed limiters, etc.).

NO variable throat. Spray nozzles are used to inject water to the packing.

Describe pH monitoring and pH adjustment systems, if applicable.

pH of the recycle liquor will be maintained between 6 and 7.5 using 20% caustic solution.

Describe mist eliminator or separator (type, configuration, backflush capability, frequency).

2-stage demister: FRP chevron and polypropylene mesh pad

Attach particulate size efficiency curve.

N/A

Operating Parameters

Inlet volume of gases handled 34,226 (ACFM) @ 135 °F	Outlet volume of gases handled 34,226 (ACFM) @ 135 °F 17.3 % Moisture

Liquid flow rates. Describe equipment provided to measure liquid flow rates to scrubber (e.g., quenching section, recirculating solution, makeup water, bleed flow, etc.)

2.2 gpm, liquid discharge from packed tower. Flow meters will be provided to measure the recirculation and blowdown rates.

Describe scrubber liquid supply system (amount of make-up and recirculating liquid, capacity of recirculating liquid system, etc).

Liquid recirculation rate = 480 gpm. 20% NaOH reagent usage = 0.7 gpm. Blowdown = 2.2 gpm. 12 gpm evaporation rate in quench chamber.

State pressure drop range (in water) across scrubber (e.g., venturi throat, packed bed, etc.) only. Describe the equipment provide to measure the pressure drop. Do not include duct or de-mister losses.

4 in. w.c.

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements. Los of scrubbing liquor, high and low pH, and high pressure drop will be alarmed. See Attachment 2.

Emissions Data -- *See Attachment 3*

Pollutant	Inlet	Outlet	Removal Efficiency (%)

Section C - Air Cleaning Device (Continued)

5. Electrostatic Precipitator – NOT APPLICABLE

Equipment specifications

Manufacturer	Model No.	☐ Wet ☐ Dry ☐ Single-Stage ☐ Two-Stage

Gas distribution grids ☐ YES ☐ NO	Design inlet volume (SCFM) _____ Maximum operating temperature (°F) _____

Total collecting surface area _____ sq. ft. Collector plates size length _____ ft. x width _____ ft.

Number of fields _____ Number of collector plates/field _____. Spacing between collector plates _____inches.

Maximum gas velocity _____ ft/sec. Minimum gas treatment time: _____ sec.

Total discharge electrode length _____ ft.

Number of discharge electrodes _____ Number collecting electrode rappers _____

Rapper control ☐ Magnetic ☐ Pneumatic ☐ Other _____

Describe in detail

Operating parameters

Inlet gas temperature (°F) _____ Outlet gas temperature (°F) _____	State pressure drop range (water gauge) across collector only. Describe the equipment.
Volume of gas handled (ACFM) _____	Dust resistivity (ohm-cm). Will resistivity vary?

Power requirements

Number and size of Transformer Rectifier sets by electrical field

Field No.	No. of Sets	Each Transformer KVA	Each Rectifier	
			KV Ave./Peak	MaDC

Current density	Corona power	Corona power density
_____ Micro amperes/ft^2	_____ Watts/1000 ACFM	_____ Watts/ft^2

Will a flue gas conditioning system be employed? If yes, describe it.

Does air cleaning device employ hopper heaters, hopper vibrators, or hopper level detectors? If yes, describe.

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements.

Emissions data

Pollutant	Inlet	Outlet	Removal Efficiency (%)

Section C - Air Cleaning Device (Continued)

7. Absorption Equipment: Carbon Adsorber

Equipment specifications

Manufacturer	Type	Model No
Ducon (or equal)	Double Carbon Adsorber Vessel (or equal)	CASB, Size 144

Design inlet volume (SCFM)	Tower height (ft) and inside diameter (ft)
34,226 acfm @ 135 °F	12-foot diameter; 22-foot high
Packing type and size (if applicable) Pre-filter bed; 1-foot of non-activated carbon 4 carbon beds: 3 feet of activated carbon	Height of packing (ft) (if applicable) Pre-filter (Sacrificial bed): 170 ft^2 surface area 4 adsorbing beds: 452 ft^2 surface area
Number of trays (if applicable) N/A	Number of bubble caps (if applicable) N/A

Configuration: ☒ Counter-current ☐ Cross flow ☐ Cocurrent flow

Describe pH and/or other monitoring and controls
N/A

Absorbent information

Absorbent type and concentration	Sorbent injection rate	Retention time (sec)
Activated Carbon, RBHG3	See Attachment 2	

Attach equilibrium data for absorption (If applicable).

Attach any additional information regarding auxiliary equipment, reagent (slurry mix) supply system (once through or recirculating, system capacity, etc) to thoroughly evaluate the control equipment. Indicate the flow rates for makeup, bleed, and recirculation.

Operating parameters

Volume of gas handled (ACFM)	Inlet temperature (°F)	Pressure drop (in of water) and liquid flow rate. Describe the equipment.
34,226	135	10 inches w.g.

State operating range for pH and/or absorbent concentration in scrubber liquid. N/A

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements.

Emissions data -- *See Attachment 3*

Pollutant	Inlet	Outlet	Removal Efficiency (%)

Section C - Air Cleaning Device (Continued) N/A

J. Other Control Equipment: _____

Equipment specifications

Manufacturer	Type	Model No

Design inlet volume (SCFM)	Capacity

Describe pH monitoring and pH adjustment, if any.

Indicate the liquid flow rate and describe equipment provided to measure pressure drop and flow rate, if any.

Attach efficiency curve and/ or other efficiency information.

Attach any additional data including auxiliary equipment and operation details to thoroughly evaluate the control equipment.

Operating parameters

Volume of gas handled

_____ @ _____ °F _____ % Moisture

Describe, in detail, important parameters and method of operation.

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements.

Emissions data

Pollutant	Inlet	Outlet	Removal Efficiency (%)

Section C - Air Cleaning Device (Continued)

10. Costs

Indicate cost associated with air cleaning device and its operating cost (attach documentation if necessary)

Device	Direct Cost	Indirect Cost	Total Cost	Operating Cost
Baghouse, SCR, packed tower, and carbon adsorber	$2.235 million	$1 million	$3.235 million	Approx $500,000/yr

11 MISCELLANEOUS

Describe in detail the removal, handling and disposal of dust, effluent, etc. from the air cleaning device including proposed methods of controlling fugitive emissions.

Dust from the baghouse will be containerized and disposed off site at a licensed facility.

Attach manufacturer's performance guarantees and/or warranties for each of the major components of the control system (or complete system).

See Ducon proposal in Attachment 2.

Attach the maintenance schedule for the control equipment and any part of the process equipment that, if in disrepair, would increase air contaminant emissions.

To be provided

Section D - Additional Information

Will the construction, modification, etc. of the sources covered by this application increase emissions from other sources at the facility? If so, describe and quantify.
No.

If this project is subject to any one of the following, attach a demonstration to show compliance with applicable standards

a. Prevention of Significant Deterioration permit (PSD), 40 CFR Part 52? ☐ YES ☒ NO

b. New Source Review, 25 Pa. Code Chapter 127, Subchapter E? ☐ YES ☒ NO

c. New Source Performance Standards, 40 CFR Part 60? ☐ YES ☒ NO
(If Yes, which subpart) _____

d. National Emissions Standards for Hazardous Air Pollutants (NESHAPS), 40 CFR Part 61? ☐ YES ☒ NO
If Yes, which subpart) _____

e. Maximum Achievable Control Technology (MACT), 40 CFR Part 63? ☐ YES ☒ NO
(If Yes, which subpart) _____

Attach a demonstration showing that the emissions from any new source will be the minimum attainable through the use of best available technology (BAT).

See Attachment 4

Provide emission increases and decreases in allowable (or potential) and actual emissions within the last 5 years for applicable PSD pollutant(s) if the facility is an existing major facility (for PSD purposes)

N/A. Facility is a minor source under the Clean Air Act.

Section D - Additional Information (Continued)

ndicate emission increases and decreases in tons per year (tpy), for volatile organic compounds (VOCs) and nitrogen oxides (NOx) for NSR applicability since January 1, 1991 or other applicable dates (See other applicable date in instructions). The emissions increases include all emissions including stack, fugitive, material transfer, other emission generating activities, quantifiable emissions from the exempted source(s), etc.

Permit number (if applicable)	Date issued	Indicate ***Yes*** or ***No*** if emission increases and decreases were used previously for netting	Source I.D. or Name	**VOCs**		**NOx**	
				Emission increases in potential to emit (tpy)	Creditable emission decreases in actual emissions (tpy)	Emission increases in potential to emit (tpy)	Creditable emission decreases in actual emissions (tpy)
N/A							

If the source is subject to 25 Pa. Code Chapter 127, Subchapter E, New Source Review requirements,

a. Identify Emission Reduction Credits (ERCs) for emission offsets or demonstrate ability to obtain suitable ERCs for emission offsets.

b. Provide a demonstration that the lowest achievable emission rate (LAER) control techniques will be implemented (if applicable).

c. Provide an analysis of alternate sites, sizes, production processes and environmental control techniques demonstrating that the benefits of the proposed source outweigh the environmental and social costs (if applicable).

N/A

Attach calculations and any additional information necessary to thoroughly evaluate compliance with all the applicable requirements of 25 Pa. Code Article III and applicable requirements of the Clean Air Act and regulations adopted there under. The Department may request additional information to evaluate the application such as a stand by plan, a plan for air pollution emergencies, air quality modeling, etc.

See Attachment 3

Section E - Compliance Demonstration

Note: Complete this section if the facility is not a-Title V facility. Title V facilities must complete Addendum A.

Method of Compliance Type: Check all that apply and complete all appropriate sections below.

☒ Monitoring ☒ Testing ☒ Reporting
☒ Recordkeeping ☒ Work Practice Standard

Monitoring:

a. Monitoring device type (stack test, CEM etc.): **Continuous parametric monitoring and manual logging**

b. Monitoring device location: **Various (see Item c below)**

c. Describe all parameters being monitored along with the frequency and duration of monitoring each parameter: **Amount of MSW and sludge delivered daily; pressure drop across cyclone, SCR, baghouse, scrubber, carbon bed pre-filter, and carbon beds; scrubber pH and recirculation rate; SCR inlet gas temperature and ammonia injection rate.**

Testing:

a. Reference Test Method Citation: EPA reference test methods will be used to measure the emission rates. These methods will be approved by the Department in the test protocol before the testing is performed.

b. Reference Test Method Description: **As required by the Department.**

Recordkeeping:

Describe the parameters that will be recorded and the recording frequency:

Amount of MSW and sludge delivered daily; pressure drop across cyclone, SCR, baghouse, scrubber, carbon bed pre-filter, and carbon beds; scrubber pH and recirculation rate; SCR inlet gas temperature and ammonia injection rate.

Reporting:

a. Describe the type of information to be reported and the reporting frequency:

Annual emissions will be reported by March 1 each year for the preceding calendar year.

b. Reporting start date: **March 1 of the year following startup.**

Work Practice Standard: Describe each

DTE will operate the facility in accordance with manufacturer's recommendations and good air pollution control practices.

Section F - Flue and Air Contaminant Emission

1. Estimated Maximum Emissions* - *See Attachment 3*

Pollutant	Maximum emission rate			Calculation/ Estimation Method
	specify units	lbs/hr	tons/yr.	
PM				
PM_{10}				
SO_x				
CO				
NO_x				
VOC				
Others: (e.g., HAPs)	-----	-----	-----	-----

* These emissions must be calculated based on the requested operating schedule and/or process rate e.g., operating schedule for maximum limits or restricted hours of operation and /or restricted throughput. Describe how the emission values were determined. Attach calculations.

2. Stack and Exhauster

Stack Designation/Number 1

List Source(s) or source ID exhausted to this stack: Energy production facility	% of flow exhausted to stack: 100

Stack height above grade (ft.) 57.5 Grade elevation (ft.)	Stack diameter (ft) or Outlet duct area (sq. ft.) Diameter = 46" (11.5 SF)	Weather Cap ☐ YES ☒ NO

Distance of discharge to nearest property line (ft.). Locate on topographic map.

50

Does stack height meet Good Engineering Practice (GEP)?

No; GEP stack height is not required.

If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions.

Location of Stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
	40	36	17.85	75	27	20.82

Stack Exhaust

Volume 34,500 ACFM Temperature 140 °F Moisture 17.3 %

Exhauster (attach fan curves) 25 in. of water 600 HP @ _____ RPM.

** If the datum and collection method information and codes differ from those provided on the General Information Form - Authorization Application, provide the additional required by that form on a separate sheet.

Section G - Attachments

Number and list all attachments submitted with this application below:

General Information Form

Plan Approval Application Form

Attachment 1	Project Background and Process Description
Attachment 2	Description of Emission Control Equipment
Attachment 3	Emission Calculations
Attachment 4	Regulatory Applicability Analysis
Attachment 5	Municipal Notifications and Land Use Letters - Lehigh Valley Planning Commission - City of Allentown - Proof of Delivery
Attachment 6	Air Pollution Control Act Compliance Review Form
Attachment 7	Monitoring and Recordkeeping
Attachment 8	7½-Minute Series U.S.G.S. Site Location Map
Attachment 9	Dispersion Modeling Analysis

ATTACHMENT 1

PROJECT BACKGROUND AND PROCESS DESCRIPTION

ATTACHMENT 1
PROJECT BACKGROUND AND PROCESS DESCRIPTION

Project Background

Delta Thermo Energy A, LLC (DTE) is proposing to construct a new Energy Production facility in the City of Allentown, Lehigh County, Pennsylvania. It is proposing to utilize municipal solid waste (MSW) and sludge from the City of Allentown's Wastewater Treatment Plant as feedstock to produce a fuel to generate 3 to 4 gross megawatts (MW) of electricity for internal use and sale. DTE has leased an undeveloped parcel of land from the City of Allentown located at 112 Union Street in Allentown, Pennsylvania, where the facility will be constructed. The facility will encompass a new building structure to house the operation, an associated driveway, and truck scale.

The facility is designed to process an average of 120 tons/day of Municipal Solid Waste and 47 tons/day of the City of Allentown's Wastewater Treatment Plant sludge as feedstock. The facility will include a new building to house the energy production operations and equipment, an associated driveway, and truck scale. DTE has leased an undeveloped parcel of land from the City of Allentown located adjacent to the Allentown WWTP at 112 Union Street in Allentown, Pennsylvania, in order to construct and operate this proposed facility.

The purpose of the facility is to produce commercial quantities of a renewable clean fuel and electricity through the on-site conversion of feedstock. The facility will use presorting of the MSW to increase the recovery of recyclables and state-of-the-art technology (named the Resource Recovery System, RRS) to convert feedstock to a renewable clean fuel that will be combusted using an improved Stoker-type combustor to generate steam, which in turn will power a turbine to generate a green, renewable source of electricity. This particular type of technology to produce the renewable clean fuel has not yet been deployed in the United States, and hence the Allentown plant will be the first of its kind in the United States. While this plant will be a commercial operation, it will also be used to collect valuable data for research purposes. The research derived from this plant can be used to improve the current design, improve on the overall process, and design the next generation plants. The process will then be marketed by DTE for use in other parts of Pennsylvania and other states and other countries.

On September 24, 2010, DTE submitted a Request for Determination of Requirement for Plan Approval/Operating Permit (RFD) to construct a research & development energy production facility. On October 14, 2010, the Department approved this RFD (No. 1737), authorizing construction and operation of the facility. In the intervening period, the facility design has been finalized, allowing DTE to operate it on a full-scale, commercial basis, rather than only a research & development basis. The emissions of all pollutants from the full-scale facility will be of the same magnitude allowed in the RFD, and, with the incorporation of appropriate emission control devices, will be significantly less than the thresholds for research and development facilities published in the Department's current plan approval exemption listing, dated July 26,

2003. Accordingly, DTE believes that construction of the facility can be initiated under the approved RFD, prior to issuance of the plan approval.

Process Description

This process has several distinct unit operations all of which work together to supply the Resource Recycling System (RRS) with raw feedstock. The following unit operations are part of the process:

- Manual sorting of recyclables and unwanted items from the MSW
- Shredding of the MSW
- Feeding approximately a 2:1 mix, by volume, of shredded MSW and sludge (herein after referred to as feedstock) to the RRS units, which are operated as batch units under high-pressure steam to produce clean renewable pulverized fuel ("PF")

  DEFINITION: PF is created from treating MSW plus sewage sludge (the "feedstock") with a unique process called Hydrothermal Decomposition (patent pending) using high pressure and high temperature steam to break down the components of the feedstock at the molecular level to produce sterilized, homogeneous renewable clean pulverized fuel with a higher heating value.

- Drying the pulverized fuel
- Burning the pulverized fuel in the Complete Combustion Chamber (CCC)
- Producing high-pressure, superheated steam in the water-tube boiler
- Using the steam in the steam turbine to generate electricity
- Ancillary equipment includes a boiler feed-water system and wastewater treatment
- Emission control system (see Attachment 2)

MSW will be collected by refuse trucks from households and public institutions and transported to the facility. Sewage sludge will be trucked to the facility from the City of Allentown Wastewater Treatment Plant adjacent to the DTE site. All trucks entering the facility will be weighed on a scale as they enter the facility, providing an accurate measure of the weight of feedstock delivered. Trucks delivering MSW will dump at the plant's tipping floor; trucks delivering sludge will dump into the shredded feedstock pit.

The tipping floor is a concrete area measuring roughly 70 feet by 100 feet, with a 0.5° slope to divert liquids to the drainage system. The MSW trucks will back into the tipping floor through one of three roll-up doors equipped with forced air curtains to provide an air seal. After the truckload is dumped, a front-end loader will push the feedstock toward the wall in the tipping floor to create a pile. Bulk items such as mattresses, furniture, and large applicances will be sorted and removed from the site. The excavator will feed feedstock onto the conveyor belt via a hopper which carries the feedstock to the sorting line where workers manually separate out the recyclables (metals and glass). The recyclable materials will be sent off site and the remaining feedstock will be shredded by an electric powered shredder and dumped into the feedstock pit in preparation for the Hydrothermal Decomposition treatment process.

A crane runs above the feedstock pit. The crane is equipped with a 81 cubic foot bucket and normally runs between the pit and the Resource Recovery System (RRS) area. The crane is controlled from the crane operating room. The crane bucket opens and closes by hydraulic cylinders. The crane picks up feedstock and feeds the mixture into the feed hoppers above the RRSs; each RRS has a dedicated feed hopper. The crane is equipped with a scale to allow the operator to control the mixing ratio. Because the RRSs are batch units, they do not require continuous feeding.

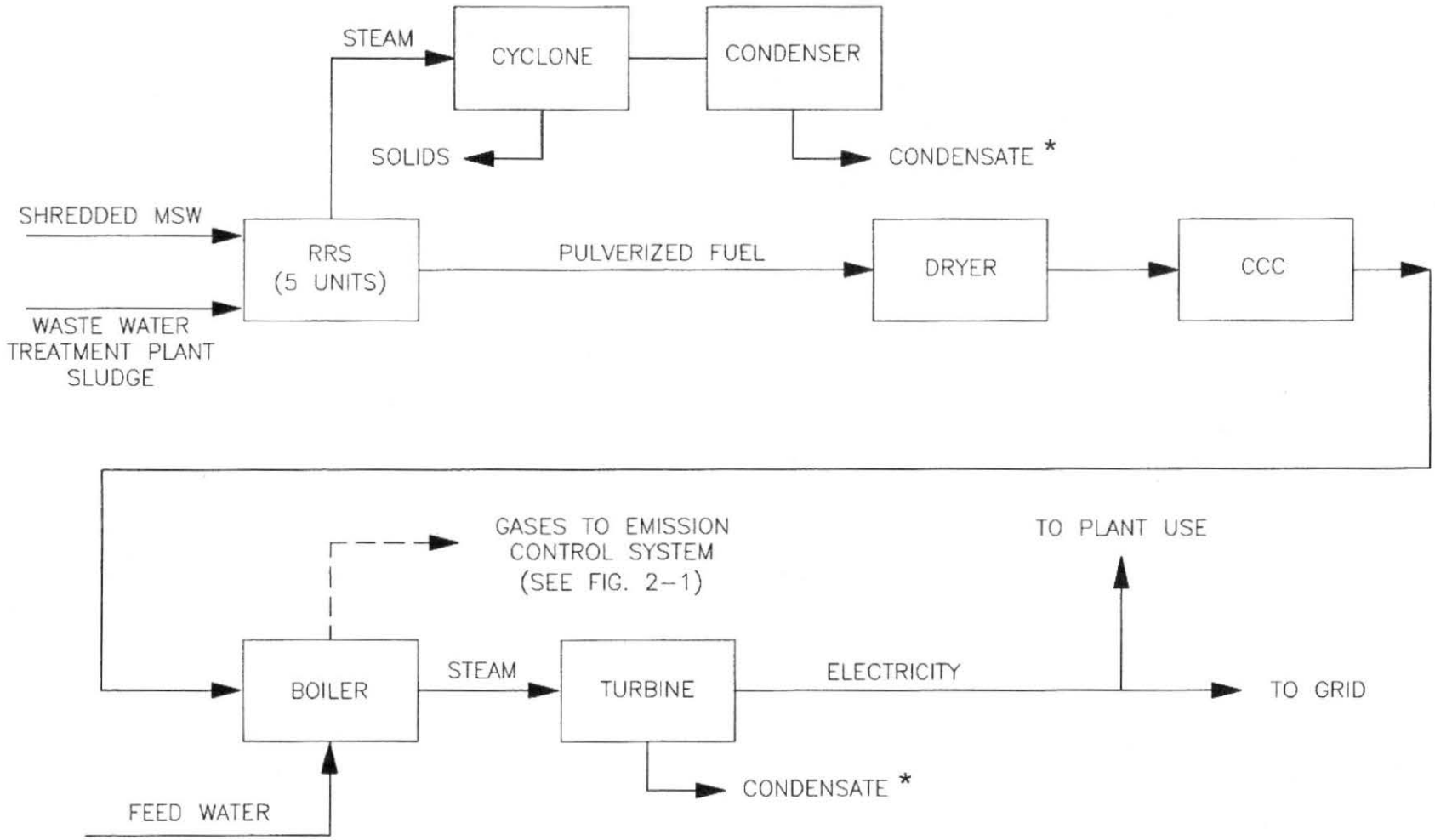
Five RRSs will be installed at the facility. Inside each unit, the feedstock will be converted to pulverized fuel (PF) by Hydrothermal Decomposition, on a batch basis. A batch takes approximately 2½ hours, divided into charging, heating, rotating, depressurization, and discharge. During charging, the feed hopper above the RRS feeds the feedstock mixture through a funnel. During depressurization, the RRS releases steam, which passes first through a cyclone to remove solids, and then to a condenser to collect the moisture. The recovered water is pumped to the wastewater treatment system. A closed loop cooling system takes the heat from the condensed steam and transfers it to the RRS heat exchanger.

At the completion of each RRS batch cycle, the PF has a moisture content of about 50 percent. As such, it is too moist for combustion and requires drying, which is achieved by a heating system in the dryer using excess heat from the facility. Evaporated moisture is exhausted from the dryer by an air stream. The air is then cooled and the collected water is discharged to the wastewater system. The drying process reduces the moisture content of the PF to about 18 percent, which is sufficient for combustion.

A complete combustion chamber (CCC) will be installed to burn the PF. An auxiliary natural gas-fired burner will be used for start-up. Once the combustion chamber reaches steady state temperature, the auxiliary firing will be discontinued, as the PF mixture is self igniting. Ash from the combustion process will be discharged by a small conveyor at the bottom of the combustion chamber for proper offsite disposal or beneficial reuse as a binding agent in cement manufacturing or road construction. Hot flue gases (approximately 1,860 °F) are transferred to the waste heat boiler where high-pressure (580 psi), superheated (750 °F) steam is produced to generate electric power in the steam turbine.

Wastewater will be treated on site before discharge to the Allentown Wastewater Treatment Plant, for which DTE will obtain a discharge permit. The Waste Heat Boiler will be equipped with an economizer to maximize energy recovery efficiency. About 18 percent of the flue gas stream from the economizer will be recirculated to the CCC for control of NO_x emissions. The balance of the flue gas stream will treated in the emission control system to reduce NO_x, PM, VOC, Hg, SO_2, and other acid gases before discharge to the outdoor air. Ancillary equipment will include condensers, heat exchanger, a boiler feed water treatment and return systems for proper operation of the facility.

Figure 1-1 presents the process flow diagram for the facility.



NOTE:

RRS: RESOURCE RECOVERY SYSTEM

CCC: COMPLETE COMBUSTION CHAMBER

* To water treatment system

ENGINEERS

Date: 3-28-13 File: EV120894.04

Figure 1-1

DELTA THERMO ENERGY, A, LLC
ALLENTOWN, PA

PROCESS FLOW DIAGRAM
ENERGY PRODUCTION FACILITY

ATTACHMENT 2

DESCRIPTION OF EMISSION CONTROL EQUIPMENT

ATTACHMENT 2
EMISSION CONTROL EQUIPMENT

The energy production facility will emit Clean Air Act-regulated pollutants, including PM_{10}, NO_x, CO, SO_2, VOC, acid gases and metals. The emission control system consists of the following devices in series:

- Twin cyclone for primary PM removal
- Selective catalytic reduction (SCR) system with urea injection for NO_x control
- Economizer
- Flue gas recirculation for NO_x control
- Fabric filter for control of PM and metals
- Wet packed tower with caustic solution recirculation for control of SO_2, HCl, and HF
- 2-stage carbon adsorption system for VOC and mercury control
- 600-hp ID fan and discharged through a stack 57.5 feet above grade (5 feet above roof)

Figure 2-1 presents the schematic flow diagram for this system

Cyclone

Combustion gases exhausted from the boiler will enter the cyclone at a temperature of 550-650 °F, where dry centrifugal separation removes more than 80 percent of the particulate. The pressure drop across the cyclone is 5 inches w.g. The collected dust will be containerized for off-site disposal at a licensed facility. The cyclone is followed by the SCR system.

SCR System

Exhaust gases from the cyclone will be at a sufficient temperature (>560 °F) to initiate the reaction for conversion of NO_x to N_2 in the SCR unit. Urea (30 to 40 percent solution) will be injected into the duct upstream of the SCR unit. The minimum NOx removal efficiency will be 85 percent. Pressure drop across the catalyst bed will be 2-3 inches w.g. Ammonia slip in the stack gases will not exceed 5 ppmv. The SCR system will be followed by the economizer, which will extract useful heat for pre-heating the boiler feedwater and lower the gas temperature to protect the bags in the fabric filter. Approximately 18 percent of the flue gas stream will be recirculated to the CCC for NO_x control. Urea will be delivered as needed in integrated bulk containers (totes).

Fabric Filter

Exhaust gases from the boiler economizer (320 °F) will be treated in the fabric filter, which will contain 640 bags with a total filtration area of 14,080 ft^2. The bags are P84 (polyimide fiber) bags, 6 inches in diameter and 14 feet long. Compressed air will be used to clean the bags when the pressure drop reaches 4-6 inches w.g. The minimum fabric filter efficiency for PM and

metals will be greater than 99.4 percent. Dust collected in the hopper will be containerized and sent off site for disposal at an approved facility.

Packed Tower Scrubber

Exhaust gases from the fabric filter will be cooled in the quench chamber from 320 °F to 135 °F by water injection, prior to entering the packed tower. The packed column is 10 feet in diameter with 8 feet of polypropylene packing to promote intimate contact between the gaseous and liquid phases. Liquor containing caustic soda (pH 6.0 to 7.5) will be recirculated in the packed column to remove acid gases. 20% sodium hydroxide solution will be used to maintain the appropriate pH in the scrubber system. The scrubber will be equipped with a 2-stage demister -- an FRP chevron demister and a polypropylene mesh pad to remove liquid droplets. The removal efficiency for SO_2 and HCl will be greater than 99 percent; the HF removal efficiency will be greater than 87 percent. Approximately 2.2 gpm of blowdown from the scrubber will be discharged to the on-site wastewater treatment plant before discharge to the City of Allentown WWTP, for which DTE will obtain a valid wastewater discharge permit.

Carbon Adsorption System

The saturated gas stream from the scrubber system will be treated in the pre-filter to remove residual water droplets, acting as a water trap to minimize carryover into the carbon adsorption system. The carbon system consists of two components -- the first component is a sacrificial bed containing non-activated carbon; the second component includes four beds containing activated carbon. The sacrificial bed surface area is 170 square feet; the total surface are of the four activated carbon beds is 452 square feet. The carbon system removal efficiency will be greater than 90 percent for mercury and 75 percent for VOC. Exhaust gases from the carbon system will be transported by an ID fan complete with a 600 hp motor and discharged to the outdoor air through a stack 57.5 feet above grade.

The quotation from Ducon containing the performance guarantees is enclosed in this attachment. The Operations & Maintenance Manual will be submitted at a later date.

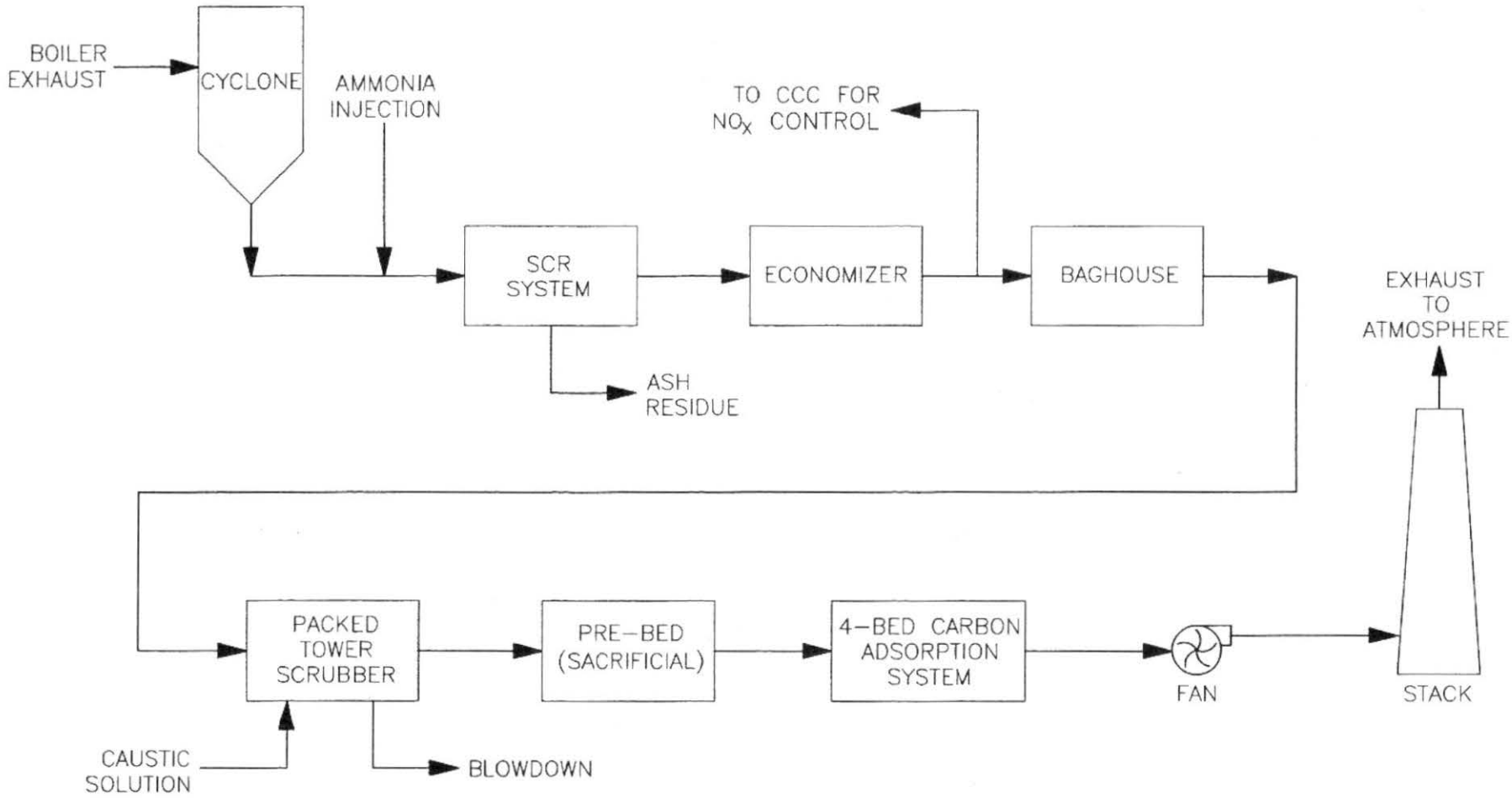


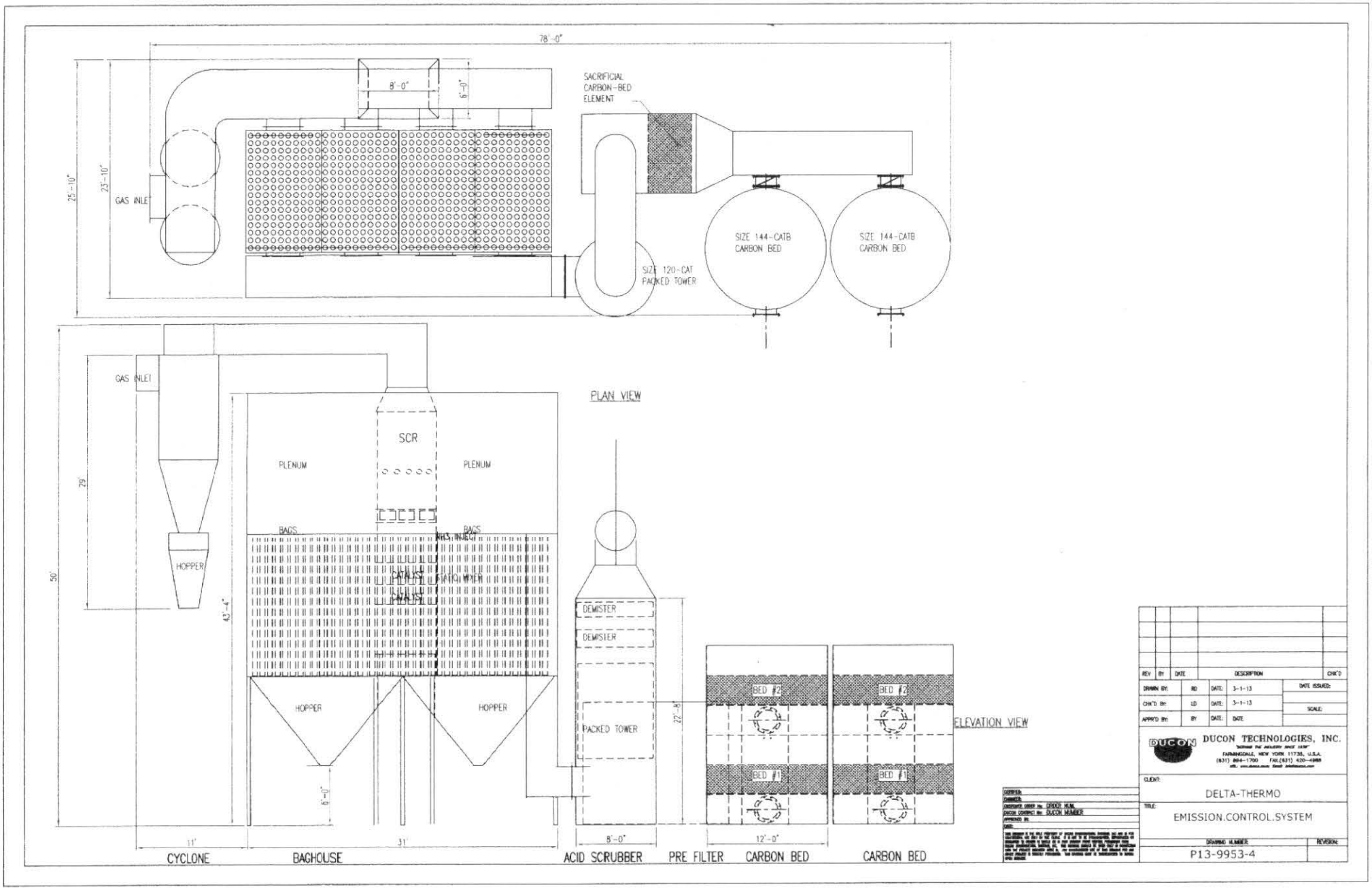
Figure 2-1

DELTA THERMO ENERGY, A, LLC
ALLENTOWN, PA

PROCESS FLOW DIAGRAM
EMISSION CONTROL SYSTEM

ENGINEERS

Date: 3-28-13 File: EV120894.04


78'-0"
8'-0"
6'-0"
SACRIFICIAL CARBON-BED ELEMENT
25'-10"
23'-10"
GAS INLET
SIZE 144-CATB CARBON BED
SIZE 144-CATB CARBON BED
SIZE 120-CAT PACKED TOWER
PLAN VIEW
GAS INLET
SCR
PLENUM
PLENUM
BAGS
BAGS
HOPPER
CATALYST
50'
29'
43'-4"
HOPPER
HOPPER
6'-0"
DEMISTER
DEMISTER
PACKED TOWER
22'-8"
BED #2
BED #2
BED #1
BED #1
ELEVATION VIEW
11'
31'
8'-0"
12'-0"
CYCLONE
BAGHOUSE
ACID SCRUBBER
PRE FILTER
CARBON BED
CARBON BED
REV
BY
DATE
DESCRIPTION
CHK'D
DRAWN BY:
RD
DATE:
3-1-13
DATE ISSUED:
CHK'D BY:
LD
DATE:
3-1-13
APPR'D BY:
BY
DATE:
DATE
SCALE:
DUCON
DUCON TECHNOLOGIES, INC.
FARMINGDALE, NEW YORK 11735, U.S.A.
(631) 864-1700 FAX:(631) 420-4988
CLIENT:
DELTA-THERMO
TITLE:
EMISSION.CONTROL.SYSTEM
DRAWING NUMBER:
P13-9953-4
REVISION:

"Leaders in Air Pollution Control Since 1938"
DUCON TECHNOLOGIES INC.
19 Engineers Lane, Farmingdale, NY 11735, USA
Tel: (631) 694-1700 • Fax: (631) 420-4985
URL: www.ducon.com • E-mail: info@ducon.com

PROPOSAL # P13-9953-Rev B corrected

DELTA THERMO

To: Rob Van Naarden	From: Lou D'Ambrosio
Email: rvannaarden@deltathermo.com	Pages: 8 including this page
CC:	Date: March 27 2013

This proposal is in response to your recent Request for Quote for an Air Pollution Control System to remove Acid Gases, Mercury, NOx and Particulates from a Municipal Waste Combustion Unit Exhaust stream.

The Ducon APC Equipment will be furnished as a "Near Turn Key Unit". Equipment is pre-assembled, and piped, then broken down for shipment to the site

Process Flow Description:

The combustion exhaust gas horizontally enters the Ducon Cyclone at a temperature of 550-600F where dry centrifugal separation removes >80% of particulate. The collected dust is expelled through automatic Dump Valves. Gas exiting the Cyclone enters the Ducon "SCR Reactor". Ammonia is injected into the gas stream to enable the reaction with the Catalyst for NOx removal. The gas then enters the"Pulse Jet" Baghouse where particulate is captured at a high removal efficiency. The collected dust is expelled through automatic Dump Valves. Upon exit of baghouse the gas then enters a Spray Quench and Packed Tower section.

The packed tower will contain a high-efficiency, low-pressure drop packing to enhance intimate contact between the gas and liquid. The water sprayed on the packing contains a low concentration of sodium hydroxide to react with the Acid Gases. The cleaned gas then passes through a 2 stages of high efficiency demister section to remove entrained water droplets. The gas then exits the packed tower scrubber and travels through a stainless steel duct to the carbon adsorber section.

The carbon adsorber must be protected from water that could be present during an upset. A sacrificial carbon bed is supplied for this purpose. The activated carbon bed is a single layer, multi compartment design. The gas then enters the Induced Draft Fan for exit to the stack. *For arrangement see Ducon Dwg # P13-9953-1*

Equipment:

- **One (1) Ducon Twin Cyclone**, Model 810, Size 2-635, complete with flanged horizontal gas inlet, barrels,cones,common hopper and a flanged gas outlet connection on top. Includes Double Dump Valve.
  For overall dimensions see, Ducon Drawing No. P13-9953-3

Pressure Drop	5" w.c.
Fractional Efficiency Curve	11A
Material of Construction:	
Cyclone Shell	1/4" Carbon Steel
Cyclone Target Liner	¼" AR-400

SCR Reactor Unit

- One (1) Ducon "Reactor". Model# NR90- Size 36 complete with inlet gas disperser, side body access doors. Constructed of 3/16"" 2205 Alloy. Fluid nozzles assemblies constructed of Hastelloy surface and silicon carbide inserts for abrasion. Each atomizer is complete with lance with quick fitting air and pipe connections for easy replacement. The entire SDR surface is insulated for energy conservation

- **One (1) Ducon Uniflo Pulse Jet Baghouse Filter**, Model #UNF-1, Size 640 complete with flanged horizontal gas inlets, cloth filter bags, metal cages with venturis, walk-in-plenum for installation and removal of bags and cages, a flanged gas outlet connection at the side and trough hopper. Includes Double Dump Flapper Valves. For overall dimensions see, Ducon Drawing No. P13-9953-1

Pressure Drop	4 to 6 " w.c.
Compressed Air Requirement	192.0 scfm @ 80 to 100 psig.
Housing Design Pressure	+/- 17 " w.c.
Air / Cloth Ratio	3:1
Filter Bag / Cage Assemblies	640
Bag Removal	Top thru walk-in-plenum
Material of Construction:	
Housing	# 10 ga. 2205 Alloy
Hopper	# 10 ga. 2205 Alloy
Tube Sheet	1 / 4" Type 316 stainless steel
Filter Bags	6 " dia. x 14' lg. P84
Cages	6 " dia. X 14' lg. SS with venturi
Double Dump Valves	316 Stainless steel

Packed Tower Scrubber

- One (1) Ducon Packed Tower. Model # CAT, Size 96. Scrubber, sized for up to 36,000 ACFM at 135F. The casing of quench section will be constructed of 3/16" thick, Type 2205 Duplex Alloy for corrosion resistance. Scrubber is constructed of 3/16" thick 316 SS. Packing is constructed of Polypropylene. Demisting Chevron will be constructed of FRP and Mesh Pad of Polypropylene. Pressure Drop 4 " w.c.

- **Carbon Adsorber**
  Two (2) – Double Carbon Adsorber Vessel, Model#CASB, Size 144, apx 12'-0" dia x 22'-0" high complete with flanged horizontal radial gas inlets and outlets, activated carbon with necessary support grating, containment screen and flanged gas outlet. Two parallel carbon bed layers within each vessel. Vessel includes a pitched flat top, flat bottom, and access man ways. The vessel is constructed of 316L stainless for corrosion resistance. Maximum pressure drop through vessels is 10" w.c. (see attached Ducon dwg # P13-9953-4 for basic dimensions)

- **System Fan**
  One (1) System Fan

Fan Manufacturer	Air Pro
Fan Type	IEAH
Material of Construction	316 Stainless steel
Fan total static pressure	25" w.g.
Motor	480v, 3ph, TEFC, Premium Efficiency

Complete System to Include:

- Two (2) Type 316 SS ANSI Re-circulation Pumps complete with TEFC Motor.
- One (1) Type 316 SS Chemical Feed Pump complete with TEFC Motor.
- Type 316 SS Recirculation Piping and Ball valves
- Control/Instrument Package (as defined below)
- NEMA 4 Control Cabinet w/ PLC
- Magnehelic Differential Gauges for Carbon Adsorbers
- Interconnecting Pre-Filter and Duct (Scrubber to Carbon System)

Data Summary of Performance and Design

CYCLONE	
Equipment Manufacturer / Model #	Ducon , Model # 810-2-635
Inlet Gas Flow	44,764 Nm3/h
Inlet Gas Volume / Temperature	56,760 acfm @ 600 F
Pressure Differential Through Unit	5" W.G.(max)
Inlet Particulate Load	2000 mg/Nm3 (dry)
Fractional Efficiency Curve (attached)	11A
Removal Efficiency	>80%
SCR	
Equipment Manufacturer/ Model #	Ducon, Model NR-90 Size 36
Inlet Gas Flow	44,764 Nm3/h
Inlet Gas Volume / Temperature	56,760 acfm @ 600 F
Catalyst Type	DNX 1059E
Catalyst Manufacturer	Haldor Topsoe
Catalyst Layers / Surface Area	2 layers, 50ft2
NH3 Usage	<3lbs/h
SCR Unit Pressure Differential	2-3"
SCR Unit Bypass	none
Inlet NOx Load process + pre-heater	100 mg/Nm3 (dry)
NOx Removal Efficiency	> 85.6%
Outlet NOx Emission Guarantee	**5 Tons/yr**
Inlet VOC Load	20 mg/Nm3 (dry)
VOC Removal Efficiency	33% (estimate)
SCR Outlet VOC Emission	12-14 mg/Nm3 (estimate)
BAGHOUSE	
Equipment Manufacturer/ Model #	Ducon, Model #UNF-1, Size 640
Inlet Gas Flow	44,764 Nm3/h
Inlet Gas Volume / Temperature	41,767 acfm @ 320 F
Air to Cloth Ratio	3 : 1
Cloth Area	14,080
Filter Media	P84
Number of Bags (6" dia x14' lg)	640
Pressure Differential Through Unit	6" (max)
Inlet Particulate Load (from Cyclone)	<400 mg/Nm3 (dry)
PM Removal Efficiency	>99.4%
Outlet Particulate Emission Guarantee	**1.5 Tons/Yr**
ACID GAS SCRUBBER w/QUENCH	
Equipment Manufacturer, Model #	Ducon, Model #CAT, Size 96
Quench Inlet Gas Flow	44,764 Nm3/h
Quench Inlet Gas Volume / Temperature	41,767 acfm @ 320 F
Quench Water Evaporation	12 GPM (fresh water feed)
Liquid discharge from Quench	0 GPM
Scrubber Inlet Gas Volume/Temperature (after quench)	34,226 @ 135F
Scrubber Type / Size / Sump	Packed Tower / 8' Dia / Integral
Packing Type/ Depth/ Pressure Differential/ Mat'l	Lantec, QPak / 10 ft deep / 3" W.C. / Polypropylene
Packed Tower Liquid Recirculation Rate	480 GPM
Liquid discharge from Packed Tower Rate **(10% solids)**	2.2 GPM, 132 GPH
Liquid discharge pH	6.5 =+/- .3
Liquid discharge temperature	135F
Liquid discharge composition	20% Na2SO4, 62% NaHSO3, 18% Na2SO3
Reagent / Usage	20% NaOH / .7 GPM @ 20% NaOH
Demister Stages / Pressure Differential/ Mat'l	2 stages / 2" W.C. / FRP, Polypropylene
Inlet SO2 Load	487 mg/Nm3 (dry)

SO2 Removal Efficiency	>99%
Outlet SO2 Emission Guarantee	**4 Tons/Yr**
Inlet HCl Load	163 mg/Nm3
HCl Removal Efficiency	>99%
Outlet HCl Emission Guarantee	**.5 Tons/Yr**
Inlet HF Load	9.2 mg.Nm3
HF Removal Efficiency	>87%
Outlet HF Emission Guarantee	**<.46Tons/Yr**
Inlet VOC Load	12-14 mg/Nm3 (dry) (estimate)
VOC Removal Efficiency	50% (estimate)
Scrubber Outlet VOC Emission	6-7 mg/Nm3
CARBON PRE-FILTER	
Equipment Manufacturer/ Model #	Ducon, Model #PF, Size 144
Inlet Gas Volume / Temperature	34226 acfm @ 135F
Carbon Type, product#	Non Activated , Generic
Carbon Manufacturer	Generic
Surface Area (4 x 12' dia)	170 ft2
Bed Depth	1 ft
Fresh Air Addition	none
Outlet Gas Volume / Temperature	34226 acfm @ 135F
CARBON BED	
Equipment Manufacturer/ Model#	Ducon, Model #CASB, Size 144
Inlet Gas Volume / Temperature	34226 acfm @ 135F
Carbon Type, product#	Activated , RBHG3
Carbon Manufacturer	Norit
Surface Area (4 x 12' dia)	454 ft2
Bed Depth	3 ft
Inlet Hg Load	.175 mg/Nm3
Hg Removal Efficiency	>90%
Outlet Hg Emission Guarantee	**<.045mg/Nm3**
Inlet VOC Load	6-7 mg/Nm3 (dry) (estimate)
VOC Removal Efficiency	>90%
Outlet VOC Emission Guarantee	**< 4 Tons/Yr**
INDUCED DRAFT FAN	
Equipment Manufacturer	Air Pro
Inlet Gas Volume / Temperature	34226 acfm @ 135F
Static Pressure Capability	Up to 25" W.C.
HP	520 BHP

Control System Description as follows: (see attached P&ID dwg # P13-9953-2)

- Control Panel / Operator Interface

A Control Panel will be used to control / monitor / and alarm critical parameters for the Baghouse, SCR Unit,Tower Scrubber and carbon adsorber operation as detailed below.

- Baghouse Performance Monitor.

The Baghouse differential pressure is locally monitored at scrubber and signal transmitted to panel with "Rosemount .2051C" Instrument

- SCR Ammonia Sprays Monitor / Alarm

Ammonia Spray is locally monitored with in- line flow meter. Transmitter

"Rosemount 8711 " signal to control panel enables operator alarms to prohibit dry or low spray liquid conditions.

- Packed Bed Pressure Differential Monitor /Alarm

The Packed Bed differential pressure is locally monitored at scrubber and signal transmitted to panel with "Rosemount 2051C" . Alarm conditions indicate maintenance required or a special event causing clogging.

- Carbon Bed Pressure Differential Monitor /Alarm

The Packed Bed differential pressure is locally monitored at scrubber and signal transmitted to panel with "Rosemount 2051C" . Alarm conditions indicate maintenance required or a special event causing clogging.

- Timed Demister Washing

Automatic timed maintenance wash of demister stages.

- "PH Controller

Automatic control of pH enables rapid response for adjustment due to variations in Inlet conditions. Signal sent to Variable Speed Chemical Feed Pump

Price for System _____ $2,235,000. USD

Not Included in Scope
- Heat Exchangers
- Platform, railings (can be offered as option)
- Stack
- Field wiring
- Installation
- freight not included

Fill or drain piping, installation, foundations, anchor bolts, supports, ladders, platforms, waste storage tanks, are not included in the price in this proposal.

Delivery

Shipment is approximately 16 - 18 weeks after receipt of approved drawings. Drawings will be submitted for approval 3 – 4 weeks after receipt of purchase order.

This offer is subject to the attached Terms and Conditions of Sale

Very truly yours,

Lou D'Ambrosio
Product Sales Manager
Ducon Technologies
(631) 694-1700 X106

TERMS & MISCELLANEOUS ITEMS

DESIGN
All sizes and specifications are subject to modification upon completion of detailed engineering and design.

DELIVERY
Submittals and/or approval drawings shall be provided 3 to 4 weeks after receipt of written purchase order.

Equipment shall be delivered 12 to 14 weeks after receipt of approval drawing submittal. If the foregoing does not meet with your requirements, we would appreciate the opportunity to review our shop fabrication scheduling in order that we might improve upon the quoted time period.

PRICES
All prices are f.o.b. shipping points, packaged for domestic shipment and are exclusive of any federal, state, Municipal, county or other sales, use, excise, personal, property or similar taxes.

The prices are firm for acceptance within thirty (30) days, unless otherwise indicated in the proposal.

ESCALATION
This quotation and any subsequent purchase order is conditioned upon and shall be subject to escalation, if there is an escalation in the price of material due to war, international conflict, natural disaster or other circumstances beyond Ducon's control.

Our pricing includes the current material surcharges for materials delivered up to thirty (30) days after the date of this proposal. With the current volatile market conditions, and since it is not possible to obtain surcharges for material delivered after that date, surcharges for material delivered after that date will be invoiced (with supporting documentation).

TERMS
15% with purchase order. (net due)
35 % with submission of approval drawings.(net 30)
25% before shipment
25% upon shipment.(net 30)

PERFORMANCE WARRANTY
Ducon's performance guarantee, is conditioned upon the following:

i) Proposed equipment is operated under the specified design and operating conditions as stated in the proposal.

ii) The Purchaser carefully follows Ducon's instructions for the installation, operating and maintenance of the equipment.

iii) The Purchaser has fulfilled its contractual obligations.

iv)The performance testing occurs within four (4) months after erection.

If reconditioning of equipment is necessary at the time of testing, due to extended use or willful or passive neglect of the Purchaser, then such reconditioning is to be made at the expense of the Purchaser, except that Ducon may be liable for whatever is under its equipment warranty.

PER DIEM RATE

The per diem rate for field start-up and installation services, if requested, is $1800.00/man plus travel and living expenses, for each day the employee is away from the home office.

EQUIPMENT WARRANTY

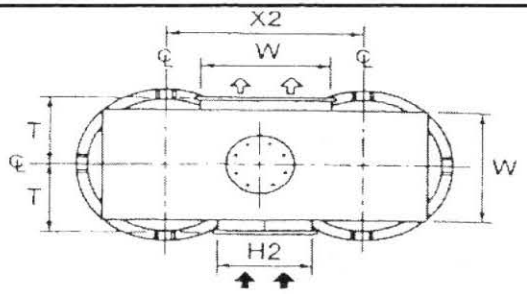
Seller warrants all equipment, materials, supplies, and other accessories furnished under this Proposal that has been manufactured by Seller, to the extent that Seller will repair or replace F.O.B. shipping point such items as are found defective in material, and workmanship (excepting corrosion and/or erosion and/or ordinary wear and tear) for one calendar year after shipment, provided the equipment is installed, operated and maintained in accordance with Seller's instructions. It is the responsibility of the Buyer to notify Seller in writing within fifteen (15) days after any difficulty becomes apparent. The Buyer must obtain from Seller in writing, permission to make any changes on Seller's Equipment or the warranty will be voided. Seller will respond as expeditiously as is reasonable in granting the customer the right to make changes or Seller will make changes.

Warranty of Equipment Manufactured By Others – Equipment furnished but not manufactured by Seller is warranted by Seller only to the extent of express warranties of the manufacturers, and not otherwise. Upon request of Buyer, Seller will request the benefits of such warranties on behalf of Buyer.

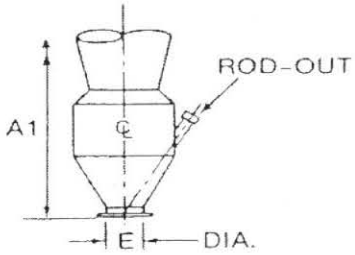
In the event of a breach or repudiation hereof by Seller, Buyer shall not been titled to recover incidental or consequential damages or any losses, costs, expenses, liabilities and damages (including but not limited to loss of use or profits, expenses or operation, downtime, reconstruction of work, damages to property, all liabilities of Buyer to its customers or third persons, and all other special or consequential damages) whether direct or indirect and whether or not resulting from or contributed to by the default or negligence of the Seller, its agents, employees, or subcontractors, which might be claimed as the result of the use or failure of the goods delivered hereunder. Seller's liability shall be limited to the price allocable to the items or service or part thereof, which gives rise to the claim, and in no event shall Seller's liability be in excess of the contract price.

No back-charges will be paid or allowed by Seller unless Seller is notified of alleged defect or omission and is given a reasonable opportunity to inspect parts and workmanship prior to corrective or replacement procedures by Buyer. All back-charges must be approved in writing by an authorized representative of Seller before parts are repaired, replaced, or altered in any manner.

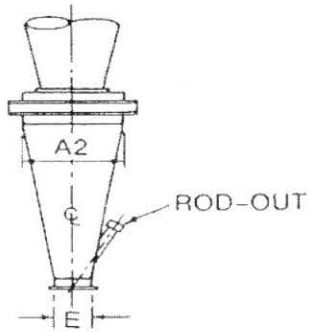
Seller shall not be liable for delays in delivery or failure to manufacture or deliver (1) due to causes beyond its reasonable control, or (2) due to acts of God, acts of civil or military authority, priorities, fires, strikes, floods, epidemics, war, riot, delays in transportation or car shortages, or (3) inability due to causes beyond its reasonable control to obtain necessary labor, materials, components, or manufacturing facilities. In the event of any such delay, the date of delivery shall be extended for a period equal to the time lost by reason of the delay.



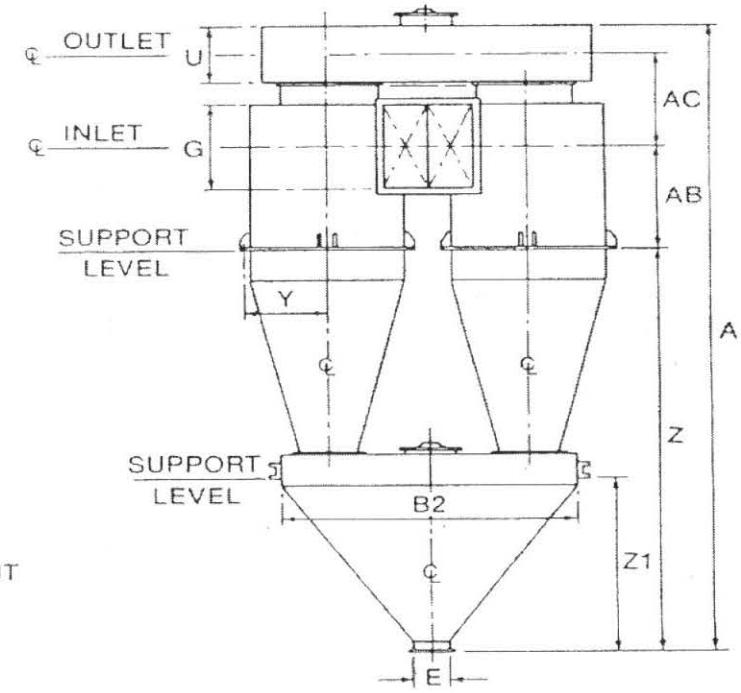
PLAN VIEW "A"



INDIVIDUAL DUST TRAPS



SIDE VIEW



Size	A	G	H2	U	W	E	X2	T	Z
2-635	28'-3"	45 3/4	40 1/2	30 1/2	61	16	92 1/2	36	217

FOR: Delta Thermo

CUSTOMER ORDER NO.:

DUCON CONTRACT NO.:

DUCON TECHNOLOGIES INC.
"Serving the Industry Since 1938"
19 Engineers Lane
Farmingdale, NY 11735, USA
Tel: (631) 694-1700 Fax: (631) 420-4985

DRAWN BY:

CH'K BY:

APP'D BY:

DATE:

DATE ISSUED

SCALE

TITLE:

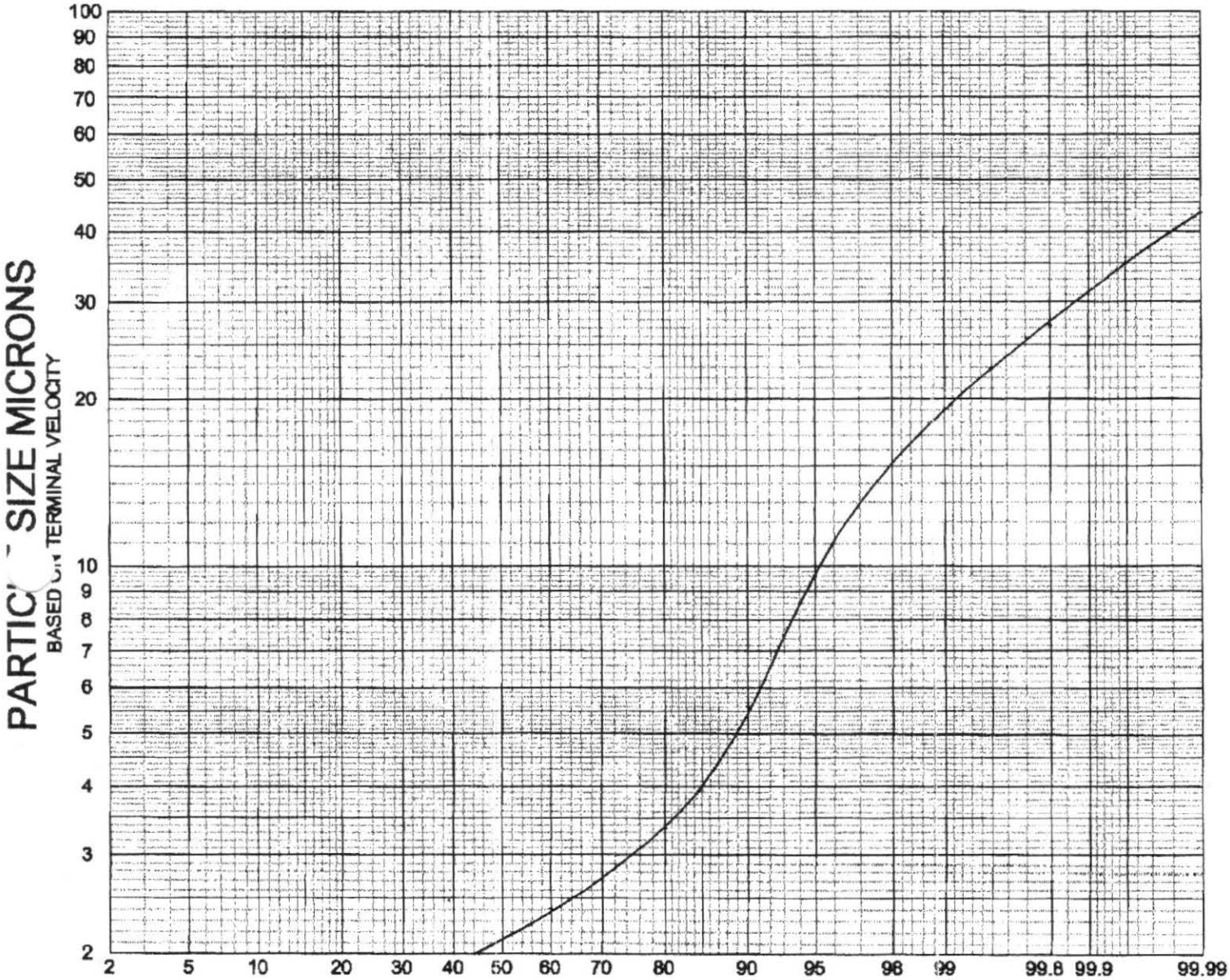
OVERALL DIMENSIONS
DUCON TWIN CYCLONE
SIZE 2-710, Type VM, Model 810

Drawing Number

P13-9953-3

Rev.

CYCLONE FRACTIONAL EFFICIENCY CURVE.
CURVE #11A



DUCON TECHNOLOGIES INC.
19 ENGINEERS LANE
FARMINGDALE, NEW YORK 11735 USA
TEL. (631) 694-1700 FAX (631) 420-4985
"Leaders In Air Pollution Control Since 1938"

ATTACHMENT 3

EMISSION CALCULATIONS

ATTACHMENT 3
EMISSION CALCULATIONS

Pre-control and controlled emissions are calculated below. These calculations are based on the following parameters:

Pulverized fuel (PF) to the CCC:	4.954 ton/hr (4,494 kg/hr)
Exhaust gas moisture content:	11.4% (volume)
Exhaust gas temperature:	160 °C (320 °F)
Boiler exhaust gas flow (wet):	44,764 Nm^3/hr
Boiler exhaust gas flow (dry):	39,661 Nm^3/hr
Operating hours:	24 hr/day; 320 day/yr; 7,680 hr/yr

PRE-CONTROL EMISSIONS

Pre-control emissions of criteria pollutants, metals, and acid gases are calculated below, using the emission factors in the table below.

Pollutant	Emission Factor, mg/Nm^3 (dry)[a]	Lb/hr	Ton/yr
NO_x	100	8.74	33.6
SO_2	477	41.71	160.2
SO_3	9.7	0.85	3.3
HCl	162	14.16	54.4
HF	9.2	0.80	3.1
CO	40	3.5	13.4
VOC	20	1.75	6.7
PM	2,000	174.88	671.5
Hg	0.175	0.015	0.058
CO_2	0.166 kg/Nm^3 (wet)	16,382	62,907

* Emission factors are taken from the Basic Engineering Report dated November 15, 2012, prepared by Jasper GmbH of Quickborn, Germany.

DTE has conducted several laboratory analyses of the feedstock after it was converted into the PF product. This information was obtained while DTE operated a pilot scale RRS reactor at the Atlantic County Utilities Authority for a 180-day period in the first half of 2012. In this pilot scale program, DTE utilized MSW and sludge from the City of Allentown and created PF product on a small scale. Samples of the PF were analyzed in laboratories to determine chemical composition, heat content and ash percentage. In addition to the City of Allentown, DTE also collect samples of MSW and sludge from several other municipalities. In total, DTE conducted

16 tests over a 180-day period. The laboratory results indicated that a fairly consistent product was produced over the entire test period. Test results are shown in the following table.

Allentown Pulverized Fuel Mix Laboratory Analysis

		Sample 1	Sample 2	Sample 3
Aluminum	mg/kg	1890	764	5200
Antimony	mg/kg	---	10.3	2.17
Arsenic	mg/kg	ND	10	4.14
Beryllium	mg/kg	---	ND	0.225
Calcium	mg/kg	24600	16200	19000
Cadmium	mg/kg	0.304	ND	3.67
Chromium	mg/kg	15.3	64.9	13.9
Copper	mg/kg	268	141	591
Iron	mg/kg	2280	---	---
Potassium	mg/kg	938	2790	1970
Magnesium	mg/kg	1030	2630	3950
Manganese	mg/kg	83.9	221	120
Molybdenum	mg/kg	---	9.52	6.54
Sodium	mg/kg	638	638	785
Selenium	mg/kg	---	ND	2.57
Thallium	mg/kg	---	21.2	ND
Nickel	mg/kg	8.92	97.2	13.2
Lead	mg/kg	15.5	ND	32.4
Zinc	mg/kg	304	420	884

Based on a sample analysis of the pulverized fuel, the metals contained in the pulverized fuel burned in the CCC are as follows.

Pollutant	Analysis, mg/kg (as-is)	Lb/hr*	Ton/yr	
Antimony	10.3	0.10	0.38	0.43
Arsenic	10.0	0.10	0.38	
Beryllium	0.225	0.0022	0.008	0.009
Cadmium	3.67	0.036	0.14	0.15
Chromium (total)	64.9	0.64	2.5	
Manganese	221	2.19	8.41	
Selenium	2.57	0.025	0.10	
Lead	32.4	0.32	1.23	
Nickel	97.2	0.96	3.69	

* Based on 4.954 tons/hr of Pulverized Fuel (or 4,494.2 kg/hr.)

A large percentage of the metals in the pulverized fuel is retained in the bottom ash following combustion, with a much smaller fraction being entrained in the boiler exhaust gases and ducted to the emission control system. The following ash retention factors are taken from a paper entitled, "The Behavior of Metals in Cement Kilns," presented by Dr. Michael Von Seebach and J. Bruce Tompkins at the 26th International Cement Seminar in December 1990.

Metal	Retained in Ash, %	Metals in Boiler Exhaust Gas (to emission control system)	
		lb/hr	ton/yr
Antimony	99.769	0.00023	0.00088
Arsenic	99.8868	0.00011	0.00043
Beryllium	99.8681	2.90×10^{-6}	1.06×10^{-5}
Cadmium	99.555	0.00016	0.00062
Chromium (total)	99.8553	0.00093	3.62×10^{-5}
Manganese	95.4002[a]	0.101	0.391
Selenium	95.4002	0.0011	0.0046
Lead	99.8531	0.00047	0.0018
Nickel	99.9574	0.00041	0.0016

a No retention factor was reported for manganese; the lowest reported retention factor for any metal (95.4002%) was conservatively used.

Start-up Emissions

The burner used during start-up is rated at 1.079 MMBTU/hr, which represents a natural gas firing rate of 1,079 scfh. Start-up operations are expected to occur three times a year, for 8 hours each time (total of 24 hr/yr). Emissions from natural gas combustion during start-up are calculated below, using AP-42 emission factors.

NO_x: 100 lb/MMcf x 1,079 scfh = 0.11 lb/hr (0.001 ton/yr)

CO: 84 lb/MMcf x 1,079 scfh = 0.09 lb/hr (0.001 ton/yr)

SO_x: 0.6 lb/MMcf x 1,079 scfh = 0.001 lb/hr (0.00001 ton/yr)

PM: 7.6 lb/MMcf x 1,079 scfh = 0.008 lb/hr (0.0001 ton/yr)

VOC: 5.5 lb/MMcf x 1,079 scfh = 0.006 lb/hr (0.0001 ton/yr)

The contribution of the burner emission is de minimis.

CONTROLLED EMISSIONS

Using the removal efficiencies of the control devices provided by Ducon, the controlled emissions in the stack gases are presented in the following table.

Pollutant	Control Efficiency, %	Controlled Emissions	
		Lb/hr	Ton/yr
NO_x	85.1	1.30	5.0
SO_2	97.5	1.04	4.0
SO_3	---	0.85	3.3
HCl	99.1	0.13	0.50
HF	85	0.12	0.46
CO	---	3.5	13.4
VOC	40.6	1.04	4.0
PM	99.8	0.39	1.5
Hg	90	0.0015	0.006
CO_2	---	16,382	62,907

Controlled metal emissions are calculated below by applying a baghouse control efficiency of 99.8 percent to the uncontrolled emissions.

Metal	Controlled Emissions	
	Lb/hr	Ton/yr
Antimony	4.6×10^{-7}	1.77×10^{-6}
Arsenic	2.2×10^{-7}	8.45×10^{-7}
Beryllium	5.8×10^{-9}	2.23×10^{-8}
Cadmium	3.2×10^{-7}	1.23×10^{-6}
Chromium (total)	1.86×10^{-6}	7.14×10^{-6}
Manganese	2.0×10^{-4}	8.0×10^{-4}
Selenium	2.2×10^{-6}	8.44×10^{-6}
Lead	9.4×10^{-7}	3.6×10^{-6}
Nickel	8.2×10^{-7}	3.15×10^{-6}

Emission Concentrations

Department regulations establish limits on PM and SO_x (SO_2 + SO_3) emissions, expressed in lb/MMBTU of heat input. The following calculations demonstrate that the regulatory limits will be met.

PM: 0.39 lb/hr ÷ 76.28 MMBTU/hr = 0.0051 lb/MMBTU, which meets the regulatory limit of 0.4 lb/MMBTU

SO_x: (1.04 + 0.85) lb/hr ÷ 76.28 MMBTU/hr = 0.025 lb/MMBTU, which meets the regulatory limit of 3 lb/MMBTU

ATTACHMENT 4

REGULATORY APPLICABILITY ANALYSIS

ATTACHMENT 4
REGULATORY APPLICABILITY ANALYSIS

DTE is required to comply with regulations promulgated by the U.S. Environmental Protection Agency (EPA) and the Pennsylvania Department of Environmental Protection (Department) with respect to emissions of air contaminants. This attachment evaluates the applicability of federal and state air quality regulations to the installation of the proposed energy production facility.

U.S. ENVIRONMENTAL PROTECTION AGENCY REGULATIONS

EPA currently regulates new and modified sources of air contaminants through four programs:

1) New Source Performance Standards (NSPS)
2) National Emission Standards for Hazardous Air Pollutants (NESHAP)
3) Maximum Achievable Control Technology (MACT) for Source Categories
4) Prevention of Significant Deterioration (PSD)/Nonattainment New Source Review (NSR)

New Source Performance Standards

The NSPS regulations currently apply to numerous categories of sources. These standards list emission limitations and operating requirements specific to each source category. The following standards, codified at 40 CFR Part 60, have potential applicability to the proposed facility. Each rule is evaluated below and a conclusion is drawn related to applicability or non-applicability.

Subpart C-b, Emissions Guidelines and Compliance Times for Large Municipal Waste Combustors that are Constructed on or Before September 20, 1994 -- This rule applies to municipal solid waste (MSW) combustors with the capacity to burn more than 250 tons per day (tpd) of MSW, and for which construction was commenced before September 20, 1994. The proposed facility has a rated throughput of 120 tpd of MSW and 47 tpd of sewage sludge, for a total of 167 tpd. Therefore, it does not meet the construction date or the throughput criteria. It should be noted that "refuse-derived fuel" (RDF) is defined in the rule as "...a type of MSW produced by shredding and size classification." Although DTE will be shredding and sorting the MSW it receives, it will not be size classified; shredding and sorting are both done to improve processing times in the batch process in the RRS. The shredded MSW will be mixed with sewage sludge and fed into the RRS units to be used as feedstock to produce a new clean pulverized fuel (PF) to be burned in the CCC unit. Therefore, while the facility will process MSW and sewage sludge, it will not burn either material; DTE will be producing and burning a completely new, sterilized, homogeneous, pulverized, de-watered fuel made from these materials and with a higher heating value than the delivered feedstock. This pulverized fuel is neither MSW nor RDF, and after being processed in the RRS units, it is no longer a waste. In fact, it has monetary value and can be sold to third parties for use as a fuel. The Pennsylvania Utility Commission (PUC) has determined that DTE's pulverized fuel meets the required standards under its Alternative Energy Portfolio Standards (AEPS) and is classified as a Tier I fuel.

As defined above, PF is created from treated feedstock in a unique process called Hydrothermal Decomposition using high pressure and high temperature steam to break down the components of the feedstock at the molecular level to produce sterilized, homogeneous renewable clean pulverized fuel with a higher heating value.

For the reasons cited above, this rule does not apply.
Subpart D, Standards of Performance for Fossil-Fuel-Fired Steam Generators -- This rule applies to fossil fuel- and wood residue-fired steam generating units with rated heat input of more than 250 MMBTU/hr. The Complete Combustion Chamber (CCC) will have a rated heat input of approximately 76.28 MMBTU/hr, and will not burn fossil fuel or wood residue, except for the natural gas-fired start-up burner, which has a rated heat input of 1.1 MMBTU/hr. Therefore, the facility does not include a fossil-fuel-fired steam generating unit and this rule does not apply.

Subpart D-a, Standards of Performance for Electric Utility Steam Generating Units -- This rule applies to electric utility steam-generating units, defined as "any steam electric generating unit capable of burning more than 250 MMBTU/hr of fossil fuel (natural gas, petroleum, coal, and any form of solid, liquid, or gaseous fuel derived from such material for the purpose of creating useful heat) that is constructed for the purpose of supplying more than one-third of its potential electric output capacity and more than 25 MW net-electrical output to any utility power distribution system for sale." The CCC at the DTE facility will have a rated heat input of 76.28 MMBTU/hr, and the net electrical output will be on the order of 1 to 2 MW. Accordingly, the facility does not exceed the regulatory thresholds for heat input or net-electrical output, and this rule does not apply.

Subpart D-b, Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units -- This rule applies to steam generating units that burn any fuel, by-product or waste, and have heat input capacities between 100 and 250 MMBTU hr from fuels burned in the steam generating unit. The CCC at the proposed facility will have a rated heat input capacity of 76.28 MMBTU/hr. The fuel burned in the CCC unit is not a by-product or a waste. Moreover, fuel is not burned in the steam-generating unit. Therefore, this rule does not apply.

Subpart D-c, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units -- This rule applies to steam generating units that have heat input capacities between 10 and 100 MMBTU hr. A "steam generating unit" is defined as "a device that combusts any fuel and produces steam or heats water or heats any heat transfer medium. This term includes any duct burner that combusts fuel and is part of a combined cycle system. This term does not include process heaters as defined in this subpart." At the DTE facility, the fuel is burned in the CCC but the steam is produced in the waste heat boiler. Thus, there is no single device in which the both the fuel combustion and the steam generation take place. Accordingly, this rule does not apply.

Subpart E, Standards of Performance for Incinerators -- This rule applies to incinerators with a charging rate greater than 50 tpd. "Incinerator" is defined as "any furnace used in the process of burning solid waste for the purpose of reducing the volume of the waste by removing

combustible matter." "Solid waste" is defined as "refuse, more than 50 percent of which is municipal type waste consisting of a mixture of paper, wood, yard wastes, food wastes, plastics, leather, rubber, and other combustibles, and noncombustible materials such as glass and rock." While the CCC has a charging rate above 50 tpd, it does not burn a solid waste, as defined in the rule. It burns a homogeneous pulverized, de-watered fuel produced from feedstock. Therefore, this rule does not apply.

Subpart E-b, Standards of Performance for Large Municipal Waste Combustors for Which Construction is Commenced After September 20, 1994 or for Which Modification or Reconstruction is Commenced After June 19, 1996 -- This rule applies to each municipal waste combustor unit with a combustion capacity greater than 250 tons per day of municipal solid waste for which construction, modification, or reconstruction is commenced after September 20, 1994. The proposed DTE facility will not burn MSW; it will burn a processed (pulverized and dried) fuel prepared from MSW and sewage sludge feedstock. The rule defines RDF as a type of MSW that has undergone shredding and size classification. The waste at the DTE facility will not undergo size classification. Moreover, the facility will not have the capacity to burn more than 250 tpd. Therefore, since the processed fuel is neither MSW nor RDF, this rule does not apply.

Subpart O, Standards of Performance for Sewage Treatment Plants -- This rule applies to each incinerator that combusts wastes containing more than 10 percent sewage sludge (dry basis) produced by municipal sewage treatment plants, or each incinerator that charges more than 1,000 kg (2,205 lb) per day municipal sewage sludge (dry basis). The DTE facility will not be burning sewage sludge, but rather a fuel produced from MSW and sewage sludge. This fuel is not considered a waste. Therefore, this rule does not apply.

Subpart GG, Standards of Performance for Stationary Gas Turbines -- This rule applies to stationary gas turbines with a heat input at peak load equal to or greater than 10 MMBTU/hr, based on the lower heating value of the fuel fired. The rule defines the following terms:

> "Stationary gas turbine" means "any simple cycle gas turbine, regenerative cycle gas turbine or any gas turbine portion of a combined cycle steam/electric generating system that is not self propelled."
>
> "Simple cycle gas turbine" means any stationary gas turbine which does not recover heat from the gas turbine exhaust gases to preheat the inlet combustion air to the gas turbine, or which does not recover heat from the gas turbine exhaust gases to heat water or generate steam."
>
> "Regenerative cycle gas turbine" means "any stationary gas turbine which recovers heat from the gas turbine exhaust gases to preheat the inlet combustion air to the gas turbine."
>
> "Combined cycle gas turbine" means "any stationary gas turbine which recovers heat from the gas turbine exhaust gases to heat water or generate steam."

The turbine at the DTE facility is a steam turbine, not a gas turbine. Therefore, this rule does not apply.

Subpart AAAA, Standards of Performance for Small Municipal Waste Combustion Units for Which Construction is Commenced after August 30, 1999, or for which Modification or Reconstruction is Commenced after June 6, 2001 -- This rule applies to municipal solid waste combustion units constructed after August 30, 1999, and having the capacity to combust at least 35 tons per day but no more than 250 tons per day of municipal solid waste (MSW) or refuse-derived fuel (RDF). The proposed DTE facility will not burn MSW; it will burn a processed (pulverized and de-watered) fuel prepared from MSW and sewage sludge feedstock by a batch Hydrothermal Decomposition process through the injection of high pressure and high temperature steam into a specialized piece of equipment identified as the RRS chamber. This unique process does not meet the definition of refuse-derived fuel (RDF) produced through size classification in this regulation. The waste at the DTE facility will not undergo size classification. Therefore, since the processed fuel is neither MSW nor RDF, this rule does not apply.

Subpart CCCC, Standards of Performance for Commercial and Industrial Solid Waste Incineration Units -- This rule applies to Commercial and Industrial Solid Waste Incineration (CISWI) units, defined as "any distinct operating unit of any commercial or industrial facility that combusts, or has combusted in the preceding 6 months, any "solid waste," which is defined as "any garbage, or refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved materials in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to permit under 33 U.S.C. 1342, or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923)." Since DTE will be burning a produced fuel (not a waste), this rule does not apply.

The rule exempts small power production facilities DTE understands that this plant is classified as a small power production facility.

Subpart EEEE, Standards of Performance for Other Solid Waste Incineration Units for Which Construction is Commenced After December 9, 2004, or for Which Modification or Reconstruction is Commenced on or After June 16, 2006 -- This rule applies to Other Solid Waste Incineration (OSWI) units and includes the following definitions:

> "Other Solid Waste Incineration Units" means either a very small municipal waste combustion unit or an institutional waste incineration unit.
>
> "Very small municipal waste combustion unit" means any municipal waste combustion unit that has the capacity to combust less than 35 tons per day of municipal solid waste or refuse-derived fuel.

> "Institutional waste incineration unit" means any combustion unit that combusts institutional waste and is a distinct operating unit of the institutional facility that generated the waste.

The DTE facility will burn more than 35 tpd of produced fuel (not MSW or refuse-derived fuel) and is not part of a facility where waste is generated. Therefore, it does not satisfy the regulatory definitions and the rule does not apply.

Subpart KKKK, Standards of Performance for Stationary Combustion Turbines -- This rule applies to stationary combustion turbines with a heat input at peak load equal to or greater than 10 MMBTU/hr, based on the higher heating value of the fuel. Only heat input to the combustion turbine should be included when determining whether or not this subpart is applicable to a turbine. Any additional heat input to associated heat recovery steam generators (HRSG) or duct burners should not be included when determining peak heat input. However, this subpart does apply to emissions from any associated HRSG and duct burners. The DTE turbine is a steam turbine, not a stationary combustion turbine. It does not have direct heat input; all heat is provided to the CCC. Therefore, this rule does not apply.

Subpart LLLL, Standards of Performance for New Sewage Sludge Incineration Units -- This rule applies to sewage sludge incineration units, defined as "incineration units combusting sewage sludge for the purpose of reducing the volume of the sewage sludge by removing combustible matter. Sewage sludge incineration unit designs include fluidized bed and multiple hearth. An SSI unit also includes, but is not limited to, the sewage sludge feed system, auxiliary fuel feed system, grate system, flue gas system, waste heat recovery equipment, if any, and bottom ash system. The SSI unit includes all ash handling systems connected to the bottom ash handling system. The combustion unit bottom ash system ends at the truck loading station or similar equipment that transfers the ash to final disposal. The DTE facility will not burn sewage sludge, but rather pulverized, de-watered fuel produced from MSW and sewage sludge feedstock. Therefore, this rule does not apply.

National Emission Standards for Hazardous Air Pollutants

The NESHAP regulations apply to the following compounds listed as hazardous air pollutants (HAPs) prior to the passage of the Clean Air Act Amendments of 1990 (CAAA): asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and vinyl chloride. The regulation lists emission limits and operating parameters that must be followed for specifically listed sources that emit these compounds. The following standards, codified at 40 CFR Part 61, have potential applicability to the proposed facility. Each rule is evaluated below and a conclusion is drawn related to applicability or non-applicability.

Subpart C, National Emission Standard for Beryllium -- This rule applies to the following process categories: extraction plants, ceramic plants, foundries, incinerators, and propellant plants which process beryllium ore, beryllium, beryllium oxide, beryllium alloys, or beryllium-containing waste. The following terms are defined in the rule:

> "Beryllium-containing waste" means material contaminated with beryllium and/or beryllium compounds used or generated during any process or operation performed by a source subject to this subpart.
>
> "Incinerator" means any furnace used in the process of burning waste for the primary purpose of reducing the volume of the waste by removing combustible matter.

Trace amounts of beryllium may be present in the feedstock streams received at the DTE facility; however, DTE will not be processing "beryllium-containing waste" from any of the source operations identified in the applicability section. Therefore, this rule does not apply.

Subpart E, National Emission Standard for Mercury -- This rule applies to several process categories including the incineration or drying of wastewater treatment plant sludge. Relevant definitions from this rule are as follows:

> "Sludge" means sludge produced by a treatment plant that processes municipal or industrial waste waters.
>
> "Sludge dryer" means a device used to reduce the moisture content of sludge by heating to temperatures above 65 °C (150 °F) directly with combustion gases.

The DTE facility will dry a produced fuel, the majority of which is shredded MSW to which sewage sludge has been added. It will not dry wastewater treatment plant sludge. Therefore, this rule does not apply.

Maximum Achievable Control Technology Standards

MACT standards have been promulgated for numerous categories of major HAP sources (those with potential emissions of 10 or more tons per year of any individual HAP or 25 tons per year of combined HAPs). Recently, EPA has promulgated a number of Generally Achievable Control Technology (GACT) standards applicable to area (minor) HAP sources. The MACT and GACT standards typically impose emission limitations and operating requirements specific to each source type. The following standards, codified at 40 CFR Part 63, have potential applicability to the proposed facility. Each rule is evaluated below and a conclusion is drawn related to applicability or non-applicability.

Subpart DD, National Emission Standards for Hazardous Air Pollutants from Off-Site Waste and Recovery Operations -- This rule applies to major HAP-emitting facilities that receive off-site materials from specified waste sources. The rule specifically excludes household waste (a component of MSW) from the list of specified waste sources. Since the DTE facility will not be a major HAP-emitting facility and principally DTE is utilizing feedstock from household waste, this rule does not apply.

Subpart EEE, National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors -- This rule applies to incinerators, kilns, furnaces, boilers, and other devices that

combust hazardous waste; it applies to both major and area HAP sources. Since the DTE facility will not be processing hazardous waste, this rule does not apply.

Subpart YYYY, National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines -- This rule applies to stationary combustion turbines at major HAP-emitting facilities. Since the DTE facility will not be a major HAP source and the DTE turbine is not a stationary combustion turbine, this rule does not apply.

Subpart DDDDD, National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters -- This rule applies to boilers and process heaters (that use indirect heat transfer) located at major HAP facilities. Since the DTE facility will not be a major HAP source, this rule does not apply.

Subpart JJJJJJ, National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources -- This rule applies to boilers located at area HAP sources. It defines a boiler as "... an enclosed device using controlled flame combustion in which water is heated to recover thermal energy in the form of steam and/or hot water. Controlled flame combustion refers to a steady-state, or near steady-state, process wherein fuel and/or oxidizer feed rates are controlled. A device combusting solid waste, as defined in §241.3 of this chapter, is not a boiler unless the device is exempt from the definition of a solid waste incineration unit as provided in Section 129(g)(1) of the Clean Air Act. Waste heat boilers, process heaters, and autoclaves are excluded from the definition of Boiler." At the DTE facility, the pulverized fuel will be burned in the CCC, but the steam will be generated in the waste heat boiler, which is specifically exempt from Subpart JJJJJJ. Therefore, this rule does not apply.

Prevention of Significant Deterioration of Air Quality (PSD)

The federal PSD program applies to major new sources and significant modifications to major existing sources located in attainment areas. The Department has adopted the federal PSD regulations in their entirety and codified them in Chapter 127, Subchapter D of 25 PA Code. The attainment status for Lehigh County, in which the DTE facility will be located, is as follows:

Pollutant	Standard	Attainment Status
Ozone:		
- 2008 8-hour Standard	0.075 ppm	Nonattainment
- 1997 8-hour Standard	0.08 ppm	Maintenance (attainment)
Particulate Matter ($PM_{2.5}$):		
- 2006 24-hour Standard	35 $\mu g/m^3$	Nonattainment
- 2006 Annual Standard	15 $\mu g/m^3$	Nonattainment
Sulfur Dioxide:		
- 2010 1-hour Standard	0.075ppm (75 ppb)	Pending designation
- 1971 Annual Primary Standard	0.03 ppm	Attainment[a]
- 1971 24-hour Primary Standard	0.14 ppm	Attainment[a]
Carbon Monoxide:		
1971 8-hour Standard	9 ppm	Attainment
1971 1-hour Standard	35 ppm	Attainment
Nitrogen Dioxide:		
- 2010 1-hour NO_2 Standard	0.10 ppm (100 ppb)	Attainment
- 2010 Annual Primary and Secondary Standard	0.053 ppm	Attainment
Lead:		
- 2008 3-Month Rolling Average	0.15 $\mu g/m^3$	Attainment

[a] Standard will be revoked in favor of the 2010 1-hour standard.

We have conducted the applicability analysis of the PSD regulations by calculating the projected actual emission rates of attainment pollutants (SO_2, NO_2, CO, lead, and CO_2) and comparing them to the major source thresholds. These calculations are presented in Attachment 3 and are summarized in the table below, which shows that the emission increases are less than the PSD major source thresholds. Therefore, the PSD requirements are not triggered.

Pollutant	Projected Actual Emissions (tpy)	Significant Emission Rate (tpy)
SO_2	4.0	250
NO_2	5.0	250
CO	13.4	250
Lead	3.6×10^{-6}	250
CO_2	62,907	75,000

Nonattainment New Source Review (NNSR)

The NNSR regulations apply in nonattainment areas - areas that are not meeting the National Ambient Air Quality Standards (NAAQS) for one or more air contaminants. The purpose of the NNSR regulations is to allow for industrial and economic growth in nonattainment areas while progressing toward the attainment of NAAQS.

Pennsylvania's NNSR permitting program is different from the federal program. Pennsylvania's NNSR rules are set forth in 25 Pa. Code, Chapter 127, Subchapter E. These regulations apply to (i) major new sources and (ii) major modifications at major existing sources, of nonattainment pollutants, which for the DTE site are ozone (regulated by the precursors, NO_x and VOC) and $PM_{2.5}$. The potential emissions of these pollutants and their respective major source thresholds are shown in the following table.

Pollutant	Potential Emissions, tpy	Major Source Threshold, tpy	Major?
NO_x	5.0	100	No
VOC	4.0	50	No
$PM_{2.5}$	1.5	100	No

Since the facility will not be a major new source for any nonattainment pollutant, the NNSR regulations do not apply.

Mandatory Greenhouse Gas Reporting Rule

On October 30, 2009, EPA promulgated the final greenhouse gas (GHG) reporting rule (40 CFR Part 98). The DTE facility is classified under Subpart C, General Stationary Fuel Combustion Sources. Under this Subpart, facilities meeting both of the following conditions are required to submit annual reports of CO_2, N_2O, and CH_4 emissions to EPA:

- Rated heat input to all stationary fuel combustion equipment (including boilers and thermal oxidizers, but not emergency equipment), exceeds 30 MMBTU/hour; and
- Actual GHG emissions exceed 25,000 metric tons per year, as CO_2 equivalent.

The rated heat input of the CCC unit (76.28 MMBTU/hr) exceeds 30 MMBTU/hr. Once the facility is in operation, DTE will calculate the annual GHG emissions for each calendar year. If they exceed the threshold of 25,000 metric tons per year, DTE will submit the required GHG report to EPA by March 31 of the following year.

Greenhouse Gas Tailoring Rule

On June 3, 2010, EPA promulgated its final rule addressing the applicability criteria of greenhouse gas (GHG) emissions and major air quality operating permit programs. EPA is tailoring the applicability criteria of the Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs to avoid applicability of these complex programs to relatively small GHG emission sources. Without this rule, facilities that emit GHG at levels as low as 100 tons per year (tpy) would otherwise be subject to these programs that are intended for major emission sources. Industry as well as regulatory agencies would be overwhelmed by the additional permitting requirements. The Greenhouse Gas Tailoring Rule does not apply to this plan approval application since it is neither a PSD nor a Title V permit application.

PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION REGULATIONS

Pennsylvania's air quality regulations are contained in PA Title 25, Article III, the Rules and Regulations of the Department of Environmental Protection (Department). The key sections of the Department's regulations with potential applicability to this project are summarized below.

Chapter 122 - New Source Performance Standards

Chapter 122 adopts the federal New Source Performance Standards. As indicated above, this application is not subject to any NSPS regulations.

Section 123.1 - Prohibition of Certain Fugitive Emissions

This regulation imposes a general ban on fugitive emissions, except for the following activities: clearing of land; construction and demolition; grading, paving and maintenance of roads and streets; use of roads and streets; and stockpiling of materials. Where these exempt activities are conducted, the facility must implement one or more of the following measures to minimize fugitive emissions:

1. Use, where possible, of water or chemicals for control of dust in the demolition of buildings or structures, construction operations, the grading of roads or the clearing of land.
2. Application of asphalt, oil, water or suitable chemicals on dirt roads, material stockpiles and other surfaces which may give rise to airborne dusts.
3. Paving and maintenance of roadways.
4. Prompt removal of earth or other material from paved streets onto which earth or other material has been transported by trucking or earth moving equipment, erosion by water, or other means.

DTE will implements these measures, as necessary, to minimize fugitive emissions. In addition, the feedstock shredder will be located indoors, which will minimize fugitive emissions from that source. DTE will install air curtains the overhead doors serving the incoming delivery trucks.

Section 123.2 - Fugitive Particulate Matter

This section prohibits fugitive particulate emissions in such a manner that they are visible beyond the facility property line. DTE will pave the haul roads on the site. The MSW and sewage sludge will be staged indoors and the building will be maintained under negative pressure. Therefore, visible fugitive emissions beyond the facility's property line are not expected.

Section 123.11 Particulate Emissions - Combustion Units

For combustion units with rated heat input between 2.5 and 50 MMBTU/hr, allowable particulate emissions are 0.4 lb/MMBTU. As shown in Attachment 3, particulate emissions will be 0.0051 lb/MMBTU, complying with this limit.

Section 123.22(c)(1) - Sulfur Compound Emissions -- Combustion Units

Emissions of sulfur oxides, expressed as SO_2, may not exceed 3 lb/MMBTU in any 1-hour period. As shown in Attachment 3, SO_2 emissions will be 0.025 lb/MMBTU, meeting this limit.

Section 123.31 - Odor Emissions

Emissions of malodorous air contaminants into the outdoor atmosphere such that the malodors are detectable outside the property line are prohibited. The facility will receive feedstock and store it indoors and the building will be maintained under negative pressure DTE will install air curtains the overhead doors serving the incoming delivery trucks. In view of the high combustion temperature and the operation of multiple emission control devices, odors detectable beyond the property line are not expected.

Section 123.41 - Visible Emissions

Emissions may not equal or exceed 20 percent opacity for more than three minutes in any hour, and may not equal or exceed 60 percent opacity at any time. Because of the high combustion efficiency and the emission control systems, visible emissions are expected to remain within these limits.

Section 123.51 - Nitrogen Compound Emissions

This regulation applies to combustion units with rated heat input greater than 250 MMBTU/hr. The CCC has a rated heat input of 76.28 MMBTU/hr. Therefore, this rule does not apply.

Chapter 124 - Hazardous Air Pollutants

Chapter 124 adopts the National Emission Standards for Hazardous Air Pollutants codified at 40 CFR Part 61. As indicated above, the facility is not subject to these standards.

Chapter 127, Subchapter B - Plan Approval Requirements

Section 127.11 prohibits facility owners from constructing new air pollution sources or air cleaning devices without first receiving plan approval and an operating permit from the Department. Section 127.12a requires that a compliance review form be submitted with the application or on a periodic basis as authorized in the section. The plan approval application submitted herewith demonstrates DTE's compliance with this requirement. As indicated above, DTE believes that construction of the facility may commence based upon the RFD issued in 2010.

Section 127.35 - Maximum Achievable Control Technology Standards for Hazardous Air Pollutants

This section adopts the MACT Standards codified at 40 CFR Part 63. As indicated above, the facility is not subject to these standards.

Section 127.43a - Public Notification

Applicants for plan approval are required to notify the municipality and county in which the facility will be located that such application is being made. Copies of the notifications to the Lehigh Valley Planning Commission and the City of Allentown and their associated proofs of delivery are included in Attachment 5.

Chapter 127, Subchapter E - New Source Review

Major modifications to major existing sources and major new sources located in nonattainment areas are required to incorporate Lowest Achievable Emission Rate (LAER) control technology and offset the new emissions. As indicated above, the proposed project will not trigger the NSR requirements.

Section 129.57 – Storage Tanks less than or equal to 40,000-gallon capacity containing VOCs

The provisions of this section apply to stationary aboveground storage tanks (ASTs) with a capacity greater than or equal to 2,000 gallons and less than or equal to 40,000 gallons, which contain VOCs with a vapor pressure less than 1.5 psig under actual storage conditions. Since the urea solution associated with the SCR system is not a VOC, this regulation does not apply.

Sections 129.91 to 129.95 - Stationary Sources of NO_x and VOCs

These sections implement the Department's Reasonably Available Control Technology (RACT) requirements; they apply to major NO_x- and VOC-emitting facilities for which no RACT requirements are specified elsewhere in Chapter 129. The DTE facility will not be a major NO_x- or VOC-emitting facility.

Section 135.3 - Emission Reporting

This regulation requires facilities that have been previously notified by the Department to submit source reports by March 1 of each year for the previous calendar year. DTE will submit annual reports if requested by the Department.

Section 135.21 - Emission Statements

Sources located in ozone nonattainment areas and emitting VOCs or NO_x must submit annual emission statements by March 1 of each year, reporting emissions of those air contaminants for the previous year. DTE will be located in an ozone nonattainment area and will submit annual emission statements beginning in the year following startup of the facility.

Section 137.4 - Air Pollution Episode Plans

Certain sources designated by the Department must submit a standby plan to be implemented in case of an air pollution episode. DTE will submit an episode plan if requested by the Department.

BEST AVAILABLE TECHNOLOGY ANALYSIS

The energy production facility will emit PM, NO_x, SO_2, CO, HCl, HF, VOC and metals. The RRS process technology pretreats the feedstock under high pressure and high temperature to produce a clean pulverized fuel for combustion in the CCC unit.

The effectiveness of various pollutant-specific technologies is discussed below.

PM and Metals

There are several potentially applicable PM control technologies, including cyclones, high-energy venturi scrubbers, fabric filters and electrostatic precipitators (ESPs). Cyclones are only 75 to 80 percent effective on large particles, and basically ineffective in removing submicron particles and metal fumes. The effectiveness of high-energy venturis is highly dependent on particle size, but can achieve removal efficiencies approaching 95 percent. Venturi scrubbers generate a by-product wastewater stream requiring treatment. ESPs are effective in removing submicron particles but their performance depends on particle resistivity, which in the case of the DTE facility, is unknown. ESPs are less efficient on particles smaller than 0.3 microns. In view of these factors, DTE believes that a cyclone in conjunction with fabric filtration is the optimal technology for removing PM and metals. They both represent reliable and proven technology, and have been used in applications similar to the DTE project.

NO_x

NO_x is a pollutant of primary concern because the Allentown area is part of the Interstate Ozone transport Region, which is regulated as a moderate nonattainment area. There are several candidate control technologies for NOx removal, including flue gas recirculation (FGR), selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR), and combustion controls. SNCR is based on a gas-phase homogeneous reduction reaction between ammonia-containing solution and NO_x in the exhaust gas stream in the optimal temperature range between 1,800 and 2,100 °F. In an SNCR system, urea solution is injected into the combustion chamber

where NO_x is converted to N_2. SNCR systems are generally about 50 percent effective, given the limited residence time. DTE is proposing an SCR system, in which urea solution is used as a reducing agent to convert the NO_x to N_2. In an SCR system, the gas stream is heated to initiate the reaction in the catalyst bed. A temperature range of 550 to 900 °F is optimal -- below 540 °F, ammonium nitrate is formed, which can plug the catalyst; above 900 °F, the ammonia is converted to NO_x, further increasing NO_x emissions. SCR achieves NOx removal efficiencies above 85 percent. Therefore, DTE believes that the proposed combination of FGR and SCR represents BAT for this application.

Acid Gases

Acid gases including SO_2, HCl, and HF will be emitted by the DTE facility. These acid gases can be removed using wither dry or wet technology. In a dry scrubber (absorber), hydrated lime or sodium bicarbonate is injected into the gas stream where the acid gases react with the reagent, forming salts that are subsequently removed by a downstream fabric filter. Removal efficiencies of dry scrubbing systems are on the order of 85 percent. Wet scrubbing systems use alkaline solutions to absorb acid gases. Wet scrubbers can be tray type or packed columns. Tray scrubbers are more suitable for particulate applications because they minimize plugging. Packed columns are more efficient for controlling acid gases. In the case of the DTE facility, since the PM has been removed in the upstream cyclone and fabric filter, a packed column will be more effective. A 20% caustic solution will be used to maintain the pH between 6 to 7.5 to remove the acid gases. Blow-down from the packed column will be treated in the on-site wastewater treatment plant. The acid gas removal efficiency of wet scrubbing technology is more than 85 percent; hence, the packed column satisfies the Department's BAT requirement.

VOC

There are a number of technologies for VOC control -- thermal oxidation, carbon adsorption, and catalytic oxidation. Thermal and catalytic oxidation systems are not effective in controlling VOCs at low inlet concentrations as it also increases the emissions of NOx, CO, and other combustion byproducts. Carbon adsorption, on the other hand, is highly effective in removing low-concentration VOCs. It will also remove mercury, which exists in the vapor phase in the gas stream.

BAT

The proposed BAT controls are:

Pollutant	BAT Control
NO_x	Combustion controls, flue gas recirculation, and SCR with ammonia injection
Acid gases (SO_2, HCl, & HF)	Wet scrubber – Packed tower
VOC	Combustion controls and activated carbon system
PM10 & Metals	Cyclone and fabric filter
CO	Combustion controls
Mercury	Activated carbon bed system

PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

Construction of the facility will disturb more than one acre of earth. Therefore, DTE is required to notify the Pennsylvania Historical and Museum Commission concerning this project. A notification to the Commission was submitted in 2010; the Commission indicated no interest in the project site.

ATTACHMENT 5

MUNICIPAL NOTIFICATIONS AND LAND USE LETTERS

- LEHIGH VALLEY PLANNING COMMISSION
- CITY OF ALLENTOWN
- PROOF OF DELIVERY

ENGINEERS

1720 Walton Road, Blue Bell, PA 19422 610-828-3078 Fax 610-828-7842

March 27, 2013

EXPRESS MAIL
FedEx No. 7993 8531 3099
City of Allentown
Office of the Mayor
435 Hamilton Street
Allentown, PA 18101

Subject: Delta Thermo Energy, Inc.
Plan Approval Application – Land Use Notice
Energy Production Facility
IES Project No. EV120894.04

Honorable Mayor Pawlowski:

On or about March 29, 2013, Delta Thermo Energy, Inc. (DTE) will be submitting a Plan Approval application to the Pennsylvania Department of Environmental Protection (DEP) for the installation of an energy production facility. This facility will be located at 112 Union Street in Allentown and will utilize municipal solid waste and sludge from the City of Allentown Waste Water Treatment Plant as fuel to generate electricity.

Acts 67, 68, and 127, which amended the Municipalities Planning Code, direct state agencies to consider comprehensive plans and zoning ordinances when reviewing applications for permitting of facilities or infrastructure, and specify that state agencies may rely upon comprehensive plans and zoning ordinances under certain conditions as described in Sections 619.2 and 1105 of the Municipalities Planning Code. Enclosed is a General Information Form (GIF) that we have completed for this project. DEP invites you to review the attached GIF and comment on the accuracy of answers provided with regard to land use aspects of this project; please be specific to DEP and focus on the relationship to zoning ordinances.

If you wish to submit comments to DEP to become part of a land use review of this project, you must respond within 30 days from the date of receipt of this letter to the DEP office referenced in this letter. If no land use comments are received by the end of the comment period, DEP will assume that there are no substantive land use conflicts and will proceed with the normal application review process. For more information about this land use review process, visit DEP's web site at www.state.pa.us (directLINK: "Land Use Reviews").

Pursuant to Section 1905-A of the Administrative Code of 1929 (71 P.S. §510-5) and 25 Pa. Code §127.462, DTE is required to provide municipalities with formal notice of this application.

The application may be reviewed at DEP's Northeast Regional Office located at 2 Public Square, Wilkes-Barre, PA 18711-0790. Comments on this application should be submitted to Mr. Mark Wejkszner, the DEP Air Quality Program Manager, at that address. If the County has no comments, it may submit a written statement to DEP expressly waiving the 30-day comment period.

Very truly yours,

Robert W. Schlosser, P.E.
Principal Project Manager

Enclosure
cc: R. Van Naarden, DTE

FedEx

799385313099

Ship (P/U) date :
Wed 3/27/2013 5:57 pm
Blue Bell, PA, US

Delivered
Signed for by: K.ROXBERRY

Actual delivery :
Thur 3/28/2013 9:04
ALLENTOWN, PA, US

Travel History

Date/Time	Activity	Location
- 3/28/2013 - Thursday		
9:04 am	Delivered	ALLENTOWN, PA
8:13 am	On FedEx vehicle for delivery	BETHLEHEM, PA
7:27 am	At local FedEx facility	BETHLEHEM, PA
4:00 am	Departed FedEx location	NEWARK, NJ
- 3/27/2013 - Wednesday		
11:44 pm	Departed FedEx location	NEWARK, NJ
11:35 pm	Arrived at FedEx location	NEWARK, NJ
10:00 pm	Left FedEx origin facility	FORT WASHINGTON, PA
5:57 pm	Picked up	FORT WASHINGTON, PA
4:56 pm	Shipment information sent to FedEx	

Local Scan

Shipment Facts

Tracking number	799385313099	Service	FedEx Priority Overnight
Weight	0.5 lbs.	Delivered To	Mailroom

ENGINEERS

1720 Walton Road, Blue Bell, PA 19422 610-828-3078 Fax 610-828-7842

March 27, 2013

EXPRESS MAIL
FedEx No. 7993 8523 9843
Mr. Matthew Glennon
Chair, Lehigh Valley Planning Commission
961 Marcon Boulevard - Suite 310
Allentown, PA 18109

Subject: Delta Thermo Energy, Inc.
Plan Approval Application – Land Use Notice
Energy Production Facility
IES Project No. EV120894.04

Dear Mr. Glennon:

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Pursuant to Section 1905-A of the Administrative Code of 1929 (71 P.S. §510-5) and 25 Pa. Code §127.462, DTE is required to provide municipalities with formal notice of this application.

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Very truly yours,

Robert W. Schlosser, P.E.
Principal Project Manager

Enclosure
cc: R. Van Naarden, DTE

FedEx

799385239843

Ship (P/U) date:
Wed 3/27/2013 5:57 pm
Blue Bell, PA US

Delivered
Signed for by: K.SAUERZOPF

Actual delivery:
Thur 3/28/2013 9:35
ALLENTOWN, PA US

Travel History

Date/Time	Activity	Location
- 3/28/2013 - Thursday		
9:35 am	Delivered	ALLENTOWN, PA
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4:00 am	Departed FedEx location	NEWARK, NJ
- 3/27/2013 - Wednesday		
11:44 pm	Departed FedEx location	NEWARK, NJ
11:35 pm	Arrived at FedEx location	NEWARK, NJ
10:00 pm	Left FedEx origin facility	FORT WASHINGTON, PA
5:57 pm	Picked up	FORT WASHINGTON, PA
4:53 pm	Shipment information sent to FedEx	

Local Scan

Shipment Facts

Tracking number	799385239843	Service	FedEx Priority Overnight
Weight	0.5 lbs	Delivered To	Receptionist/Front Desk

ATTACHMENT 6

AIR POLLUTION CONTROL ACT
COMPLIANCE REVIEW FORM

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

AIR POLLUTION CONTROL ACT COMPLIANCE REVIEW FORM

Fully and accurately provide the following information, as specified. Attach additional sheets as necessary.

Type of Compliance Review Form Submittal (check all that apply)

☒ Original Filing
☐ Amended Filing

Date of Last Compliance Review Form Filing: __/__/____

Type of Submittal

☒ New Plan Approval ☐ New Operating Permit ☐ Renewal of Operating Permit
☐ Extension of Plan Approval ☐ Change of Ownership ☐ Periodic Submission (@ 6 mos)
☐ Other: _____

SECTION A. GENERAL APPLICATION INFORMATION

Name of Applicant/Permittee/("applicant")
(non-corporations-attach documentation of legal name)
Delta Thermo Energy A, LLC

Address One Northbrook Drive, 1210 Northbrook Corporate Center, Suite 100
Trevose, PA 19053

Telephone 215-809-1139 **Taxpayer ID#** 80-0494550

Permit, Plan Approval or Application ID# N/A

Identify the form of management under which the applicant conducts its business (check appropriate box)

☐ Individual ☐ Syndicate ☐ Government Agency
☐ Municipality ☐ Municipal Authority ☐ Joint Venture
☐ Proprietorship ☐ Fictitious Name ☐ Association
☐ Public Corporation ☐ Partnership ☐ Other Type of Business, specify below:
☒ Private Corporation ☐ Limited Partnership

Describe below the type(s) of business activities performed.
Operation of an energy production facility.

MAR 29 2013

SECTION B. GENERAL INFORMATION REGARDING "APPLICANT"

If applicant is a corporation or a division or other unit of a corporation, provide the names, principal places of business, state of incorporation, and taxpayer ID numbers of all domestic and foreign parent corporations (including the ultimate parent corporation), and all domestic and foreign subsidiary corporations of the ultimate parent corporation with operations in Pennsylvania. Please include all corporate divisions or units, (whether incorporated or unincorporated) and privately held corporations. (A diagram of corporate relationships may be provided to illustrate corporate relationships.) Attach additional sheets as necessary.

Unit Name	Principal Places of Business	State of Incorporation	Taxpayer ID	Relationship to Applicant
Delta Thermo Energy A, LLC	One Northbrook Drive, 1210 Northbrook Corp. Center, Suite 100 Trevose, PA 19053	Delaware	80-0494550	Applicant

SECTION C. SPECIFIC INFORMATION REGARDING APPLICANT AND ITS "RELATED PARTIES"

Pennsylvania Facilities. List the name and location (mailing address, municipality, county), telephone number, and relationship to applicant (parent, subsidiary or general partner) of applicant and all Related Parties' places of business, and facilities in Pennsylvania. Attach additional sheets as necessary.

Unit Name	Street Address	County and Municipality	Telephone No.	Relationship to Applicant
N/A				

Provide the names and business addresses of all general partners of the applicant and parent and subsidiary corporations, if any.

Name	Business Address
N/A	

List the names and business address of persons with overall management responsibility for the process being permitted (i.e. plant manager).

Name	Business Address
Robert Van Naarden, CEO	One Northbrook Drive, 1210 Northbrook Corp. Center, Suite 100, Trevose, PA 19053
Marco Bonilla, COO	One Northbrook Drive, 1210 Northbrook Corp. Center, Suite 100, Trevose, PA 19053

Plan Approvals or Operating Permits. List all plan approvals or operating permits issued by the Department or an approved local air pollution control agency under the APCA to the applicant or related parties that are currently in effect or have been in effect at any time 5 years prior to the date on which this form is notarized. This list shall include the plan approval and operating permit numbers, locations, issuance and expiration dates. Attach additional sheets as necessary.

Air Contamination Source	Plan Approval/ Operating Permit#	Location	Issuance Date	Expiration Date
Proposed Facility	RFD NO. 1737	City of Allentown, Lehigh County	9/24/10	N.A.

Compliance Background. (Note: Copies of specific documents, if applicable, must be made available to the Department upon its request.) List all documented conduct of violations or enforcement actions identified by the Department pursuant to the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. Attach additional sheets as necessary. See the definition of "documented conduct" for further clarification. Unless specifically directed by the Department, deviations which have been previously reported to the Department in writing, relating to monitoring and reporting, need not be reported.

Date	Location	Plan Approval/ Operating Permit#	Nature of Documented Conduct	Type of Department Action	Status: Litigation Existing/Continuing or Corrected/Date	Dollar Amount Penalty
None						$
						$
						$
						$
						$
						$
						$
						$
						$
						$

List all incidents of deviations of the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. This list must include items both currently known and unknown to the Department. Attach additional sheets as necessary. See the definition of "deviations" for further clarification.

Date	Location	Plan Approval/ Operating Permit#	Nature of Deviation	Incident Status: Litigation Existing/Continuing Or Corrected/Date
None				

CONTINUING OBLIGATION. Applicant is under a continuing obligation to update this form using the Compliance Review Supplemental Form if any additional deviations occur between the date of submission and Department action on the application.

VERIFICATION STATEMENT
Subject to the penalties of Title 18 Pa.C.S. Section 4904 and 35 P.S. Section 4009(b)(2), I verify under penalty of law that I am authorized to make this verification on behalf of the Applicant/Permittee. I further verify that the information contained in this Compliance Review Form is true and complete to the best of my belief formed after reasonable inquiry. I further verify that reasonable procedures are in place to ensure that "documented conduct" and "deviations" as defined in 25 Pa Code Section 121.1 are identified and included in the information set forth in this Compliance Review Form.
Robert Van Naarden — Signature; 3/28/13 — Date
Robert Van Naarden — Name (Print or Type)
CEO — Title

ATTACHMENT 7

MONITORING AND RECORDKEEPING

ATTACHMENT 7
MONITORING AND RECORDKEEPING

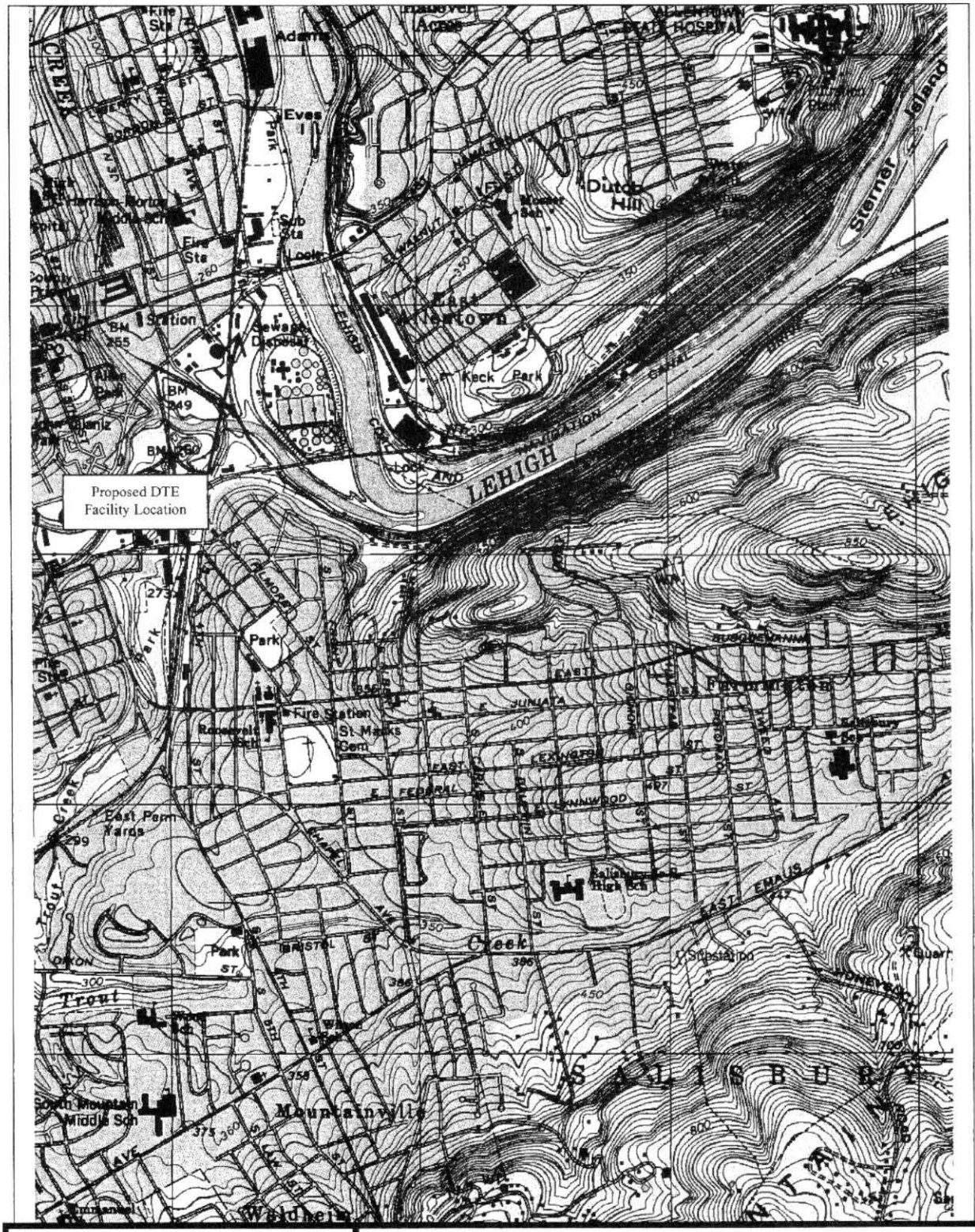
DTE will monitor the following operating parameters:

- Amount of MSW delivered daily
- Amount of sewage sludge delivered daily
- Urea injection rate into SCR system
- Gas temperature at SCR system inlet
- pH of scrubbing solution
- Scrubber liquid recirculation rate
- Pressure drop across the cyclone
- Pressure drop across baghouse
- Pressure drop across scrubber system
- Pressure drop across carbon system pre-filter
- Pressure drop across carbon beds

These parameters will be recorded on a daily basis. DTE is not proposing any Continuous Emission Monitoring Systems (CEMS), as the facility is not subject to any rule requiring CEMS installation, as shown in Attachment 4.

ATTACHMENT 8

7½-MINUTE SERIES U.S.G.S. SITE LOCATION MAP



IES ENGINEERS	**Site Location Map**
	Source: U.S.G.S. 7.5-Minute Series **Allentown East, PA Quadrangle (2001)**
Date: 03/19/13 — Job No: EV120894.04	**Plan Approval Application**

ATTACHMENT 9

DISPERSION MODELING ANALYSIS

(CONFIDENTIAL)

IES ENGINEERS

CONFIDENTIAL

1720 Walton Road Blue Bell, PA 19422 610-828-3078 Fax 610-828-7842

AIR DISPERSION MODELING REPORT

FOR

PROPOSED ENERGY PRODUCTION FACILITY
DELTA THERMO ENERGY A, LLC

112 UNION STREET
ALLENTOWN, PENNSYLVANIA

IES PROJECT NO. EV130894.02

MARCH 2013

1.0 INTRODUCTION

This report summarizes the air dispersion modeling conducted for the Delta Thermo Energy A, LLC (DTE) proposed Energy Production Facility in Allentown, Pennsylvania, located at 111 Union Street. A scaled site plan of the entire facility is provided in Appendix A.

The air dispersion modeling was conducted to determine the ambient impacts from the proposed facility to assist DTE in obtaining a Plan Approval from the Pennsylvania Department of Environmental Protection (Department) for its construction.

The energy production facility will be constructed on ground leased from the City of Allentown and use a pulverized fuel derived from municipal solid waste (MSW) and sludge from the City's wastewater treatment plant. This energy production facility will be capable of handling approximately 120 tons/day of MSW and 47 tons/day of wastewater sludge, and producing 4 to 5 megawatts of electric power for internal use and sale.

The energy production plant will consist of waste handling equipment, a resource recovery system (RRS) for converting MSW and sludge into fuel, a complete combustion chamber, a high pressure boiler, a steam turbine to produce electric power, and a stack. Waste gases from the boiler will be treated in an air pollution control (APC) system to meet Commonwealth of Pennsylvania and U.S. Environmental Protection Agency (EPA) regulations. The APC system will consist of a cyclone, SCR, fabric filter, acid gas wet scrubber, and activated carbon absorption system.

The Allentown facility will emit particulate matter (PM), oxides of nitrogen (NO_x), carbon monoxide (CO), sulfur dioxide (SO_2), metals, and other organic emissions.

In order to select the appropriate stack height and determine impacts in the community, DTE elected to perform this modeling assessment. The results of the assessment were compared against various applicable federal and state ambient concentration limits as well as Department guidelines for ambient concentrations. The results of this assessment show that the facility will meet all of the appropriate ambient concentrations.

2.0 METHODOLOGY

This section presents discussions on the modeling methodology for the air dispersion analysis.

2.1 Overview

The following software packages were used for this analysis:

- Land Cover Data Preprocessor (AERSURFACE)
- Wind Data Preprocessor (AERMINUTE)
- Meteorological Data Preprocessor (AERMET)
- Terrain Data Preprocessor (AERMAP)
- Building Profile Input Program (BPIP)
- AERMIC Dispersion Model (AERMOD)

The modeling was conducted in accordance with the following references:

- Title 40 of the Code of Federal Regulations, Part 51, Appendix W: Guideline on Air Quality Models
- EPA's *New Source Review Workshop Manual*, October 1990
- EPA's *Guideline on Air Quality Models (Revised)*, July 1986
- EPA's *Regional Workshops on Air Quality Modeling: A Summary Report*, April 1981
- EPA's *Guidelines for Air Quality Maintenance Planning and Analysis Volume 10 (Revised): Procedures for Evaluating Air Quality Impact of New Stationary Sources*, October 1977
- D. Bruce Turner *Workbook of Atmospheric Dispersion Estimates*, 1970
- EPA's *Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document For the Stack Height Regulations) Revised*, June 1985
- EPA's *Under Revision User's Guide For The AMS/EPA Regulatory Model – AERMOD*, September 2004 and *Addendum*, December 2012
- EPA's *User's Guide to the Building Profile Input Program*, October 1993

2.2 AERMOD

The American Meteorological Society (AMS) and the U.S. Environmental Protection Agency (EPA) jointly formed the AMS/EPA Regulatory Model Improvement Committee (AERMIC) to develop an accurate air quality model. They developed the AERMIC Dispersion Model (AERMOD). The AERMOD model (Version 12345) is accepted for regulatory analyses and is the recommended model for determining ground-level ambient air concentrations in all types of terrain. AERMOD is the model used for the ambient assessment for air contaminants identified in the Department's guidance document.

Under stable conditions, AERMOD uses a steady-state, Gaussian plume equation to calculate ambient concentrations from stacks. In unstable conditions, AERMOD uses a non-Gaussian probability density function to calculate ambient concentrations. Input variables to the model include: emission rates, stack heights, meteorological data, receptor locations, terrain elevations, and stack gas characteristics. The model can also be used to evaluate the effects of aerodynamic wakes and eddies that are formed by buildings and other structures on plume dispersion (PRIME model).

A review of a topographic map of the area around the facility indicates that some of the receptors may be in complex terrain. AERMOD was developed to incorporate complex terrain considerations into the model output. IES used data from the U.S. Geological Survey National Elevation Dataset for the area at a resolution of 1/9-arc-second.

EPA's Building Profile Input Program (BPIP) algorithms were used to determine the impacts of building downwash. The proposed building on site was included in the analysis. There are no significant structures offsite in the area surrounding the facility. The results of the BPIP analysis were incorporated into the AERMOD model.

AERMOD is classified by the EPA as a preferred/recommended air quality model for refined analyses. Based on the model's incorporation of algorithms to address complex terrain, multiple buildings, and EPA's "approval" of this model, AERMOD is an appropriate model for this application.

3.0 MODEL INPUT PARAMETERS

The following sections detail the emission source parameters entered into the various dispersion models used for this air quality analysis.

3.1 AERMET

AERMET is a general purpose meteorological preprocessor for organizing available meteorological data into a format suitable for use by the AERMOD air quality dispersion model. There are three stages to processing the data. The first stage extracts the meteorological data from archive data files and processes the data through various quality assessment checks. The second stage merges all data available for 24-hour periods (National Weather Service (NWS) and site-specific data) and stores these data together in a single file. The third stage reads the merged meteorological data and estimates the necessary boundary layer parameters for use by AERMOD. Two files are written for AERMOD: a file of hourly boundary layer parameter estimates and a file of multiple-level observations of wind speed and direction, temperature, and standard deviation of the fluctuating components of the wind.

During the third stage of meteorological data processing, site-specific parameters (albedo, Bowen ratio, and surface roughness) that characterize the underlying surface are used to calculate boundary level scaling parameters and reference-height winds and temperatures for the generation of the surface file, and a wind, temperature, and standard deviation of fluctuating wind components for the profile file.

As discussed below, historical analyses, nearby terrain, surface characteristics, data completeness, and potential obstructions were examined. The meteorological datasets used in the Delta Thermo modeling analysis were Lehigh Valley International Airport (KABE) 2008-2012.

3.1.1 Historical Analyses

The KABE dataset was used in this analysis, due to its availability through the National Climatic Data Center's (NCDC) Integrated Surface Data (ISD), a.k.a. DS-3505. Until recently, the Department has preferred data that was measured prior to the commencement of the Automated Surface Observing System (ASOS). The KABE dataset (measured by ASOS) is usable because the U.S. EPA recently developed a program called AERMINUTE and a revised AERMOD meteorological preprocessor (AERMET) to address concerns with data measured by the ASOS (and reported in METAR code). These programs were utilized to develop the most technically defensible meteorological dataset for use in the Delta Thermo modeling analysis.

3.1.2 Nearby Terrain and AERMAP

Terrain elevations near Delta Thermo were examined and the meteorological site using the United States Geological Survey (USGS) National Elevation Dataset (NED). IES does not

believe there is significant higher terrain in the vicinity of Delta Thermo or the meteorological site. The meteorological site is less than 3 miles from the Delta Thermo stack location.

IES obtained 1/9-arc-second (3 meter) NED data, in GeoTIFF format, electronically from the USGS EROS Data Center, National Map Viewer and Download Platform. The data used by AERMAP (version 11103) includes a 20-km square area around the site. Under the WGS84 coordinate system, the approximate coordinates of the data are:

- Top edge: 40.71 Degrees
- Bottom edge: 49.49 Degrees
- Left edge: -75.60 Degrees
- Right edge: -75.31 Degrees

The data was released in December 2012 and is considered "moderate-resolution data, other than that compiled from cartographic contours." The NED data files are presented in Appendix B.

3.1.3 Surface Characteristics

Seasonal surface characteristics (albedo, Bowen ratio, surface roughness length) were estimated near the site using AERSURFACE (version 13016) and the USGS 1992 National Land Cover Data (NLCD92). Albedo, Bowen ratio, and surface roughness length (SRL) were similar to the Delta Thermo site. The appropriateness of the current method for estimating SRL has been debated since AERSURFACE was released; however, it is presently the most appropriate method available.

3.1.4 Data Completeness

Data was extracted for the most recent five years (2008-2012) of National Climatic Data Center's (NCDC) Integrated Surface Data (ISD), a.k.a. DS-3505, for the meteorological site using Stage 1 of AERMET (version 12345). This data was deemed to be complete and appropriate for use.

3.1.5 Potential Obstructions

PAMAP aerial imagery in the vicinity of the meteorological site was examined to determine whether there are any potential obstructions (buildings/structures, trees, etc.) that may significantly affect the dataset (in particular, the wind data). The site appears to be free of potential obstructions.

3.1.6 Meteorological Dataset Recommendation

IES obtained preprocessed KABE dataset with the updated versions (11059) of the new AERMINUTE and the revised AERMET. An AERMOD-ready meteorological dataset for KABE 2008-2012 is presented in Appendix B.

3.2 AERMOD

The model input parameters for AERMOD are summarized on Tables 3-1 through 3-3.

Table 3-1
Summary of AERMOD Model Input Parameters
Delta Thermo, Allentown, Pennsylvania

Model Option	Value Selected
Calculate concentration or deposition	Concentration
Dry or wet depletion	None
Regulatory default option	Yes
Averaging period	1-hour, 3-hour, 8-hour, 24-hour, Month, Annual
Meteorological data	Data from the Lehigh Valley International Airport (KABE) dataset pre-processed with AERMINUTE (version 11059) and AERMET (version 12345) for calendar years 2008-2012.
Anemometer height	Actual for selected Airport
Wind profile exponents	As determined by Stage 3 AERMET processing with KABE-processed Stage 3 data.
Vertical temperature gradients	As determined by Stage 3 AERMET processing with KABE-processed Stage 3 data.
Grid system	Discrete receptors at the fenceline (25-m spacing); and Cartesian grid system as follows: 0-1 km (50-m spacing). Onsite receptors were excluded from this analysis.
Terrain elevations	Elevated; elevations imported from National Elevation Dataset for the area at a resolution of 1/9-arc-second
Flagpole receptors	Option not used
Building wake effects	Yes, as determined by EPA's BPIP software

A Cartesian receptor grid from the property line to 1 km with 50-meter spacing was used to determine ambient impacts. The facility's site plan is provided in Appendix A. The entire property is access-limited by fencing, which is set back from the actual property line. Receptors were placed on the fenceline at approximately 25-meter spacing. Receptors located inside the fenceline (onsite receptors) were not included in the analysis.

Source parameters, such as stack gas exit velocity or stack temperature, were based on proposed data from a March 2013 engineering analysis using manufacturer's information. Emissions data were based on the proposed emission rates determined as part of the Best Available Technology (BAT) analysis. The model was run at an emission rate of 1 gram per second for the 24/7 operating hours. The results were scaled based on the emission rates proposed in the Plan Approval application. The stack parameters and emission rates utilized are shown on Tables 3-2 and 3-3, respectively.

Table 3-2
Energy Production Facility Stack Parameters
Delta Thermo, Allentown, Pennsylvania

Parameter	Value
Stack Height	57.5 ft
Stack Diameter	3.83 ft
Exhaust Flow rate	34,500 acfm
Exit Velocity	3,000 ft/min
Exhaust Temperature	140 °F
Moisture	Saturated
Operating Hours	8,760 hours/year

Table 3-3
Proposed Energy Production Facility Emission Rates
Delta Thermo, Allentown, Pennsylvania

Pollutant	Emission Rate (lb/hr)
NO_X	1.30
SO_2	1.04
HCl	0.13
HF	0.12
CO	3.50
PM	0.39
Hg	0.0015
Arsenic	2.2×10^{-7}
Beryllium	5.8×10^{-9}
Cadmium	3.2×10^{-7}
Chromium (total)	1.86×10^{-6}
Lead	9.4×10^{-7}
Nickel	8.2×10^{-7}

BPIP software was used to determine the effects of building downwash on plume dispersion for the modeling. The proposed building was included. The direction- and height-specific output data from BPIP were directly input into the AERMOD model. The following table is a summary of building height entered into the model, and the building's base elevations as determined by AERMOD after processing the NED files:

Table 3-4
Building Elevation and Height
Delta Thermo, Allentown, Pennsylvania

AERMOD ID	Building Description	Base Elevation (ft)	Building Height (ft)
BUILDING	Proposed Building	257.32	52.5

4.0 RESULTS OF AMBIENT IMPACT ANALYSIS

The results of the refined-level modeling assessment for maximum concentrations from the Energy Production Facility stack are summarized on Table 4-1. Figures 4-1 through 4-5 show the maximum impacts on an aerial photograph (2008-2012, respectively). The model runs were conducted at a unity emission rate (1 gram per second) for the worst-case operating hours of 8,760 hours/year and scaled by the proposed emission rates. The maximum concentration for the annual averaging period occurs directly on the fence line approximately 75 meters south southeast of the Energy Production Facility's stack.

The emission rates included in this modeling analysis, proposed in the Plan Approval application submitted to the Department, show conformance with the acceptable ambient concentrations. The results indicate that emissions from the proposed energy production facility stack are in compliance with the Federal National Ambient Air Quality Standards (NAAQS), the Department's Ambient Air Quality Standards (25 Pa. Code 131.3), and the Department's guidelines for similar sources. Therefore, this modeling analysis supports DTE's request for the proposed project.

Summary of AERMOD Model Results
Proposed Energy Production Facility
Delta Thermo Energy A, LLC Allentown, Pennsylvania
EV130894.02

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						Maximum - 2008		Maximum - 2009		Maximum - 2010		Maximum - 2011		Maximum - 2012	
Pollutant	Acceptable Ambient Concentration ($\mu g/m^3$)	AAC[a] Source	Averaging Period	Potential Emission Limit (lb/hr)	Emission Rate[b] (g/s)	Maximum Concentration at Averaging Period ($\mu g/m^3$)	Percent of AAC[a] (%)	Maximum Concentration at Averaging Period ($\mu g/m^3$)	Percent of AAC[a] (%)	Maximum Concentration at Averaging Period ($\mu g/m^3$)	Percent of AAC[a] (%)	Maximum Concentration at Averaging Period ($\mu g/m^3$)	Percent of AAC[a] (%)	Maximum Concentration at Averaging Period ($\mu g/m^3$)	Percent of AAC[a] (%)
Arsenic	2.30E-04	PADEP BAT	Annual	2.20E-07	2.77E-08	4.72E-07	0.21%	4.65E-07	0.20%	5.71E-07	0.25%	4.79E-07	0.21%	4.93E-07	0.21%
Beryllium	4.20E-04	PADEP BAT	Annual	5.80E-09	7.31E-10	1.25E-08	0.00%	1.23E-08	0.00%	1.51E-08	0.00%	1.26E-08	0.00%	1.30E-08	0.00%
Beryllium	1.00E-02	PA AAQS	Month	5.80E-09	7.31E-10	2.05E-08	0.00%	1.89E-08	0.00%	2.11E-08	0.00%	2.13E-08	0.00%	2.15E-08	0.00%
Benzo(a)pyrene	5.90E-04	PADEP BAT	Annual	2.05E-04	2.58E-05	4.39E-04	74.42%	4.33E-04	73.32%	5.31E-04	90.00%	4.46E-04	75.53%	4.59E-04	77.76%
Cadmium	5.60E-04	PADEP BAT	Annual	3.20E-07	4.03E-08	6.87E-07	0.12%	6.77E-07	0.12%	8.31E-07	0.15%	6.97E-07	0.12%	7.18E-07	0.13%
Hexavalent Chromium	8.30E-05	PADEP BAT	Annual	1.86E-06	2.34E-07	3.99E-06	4.81%	3.93E-06	4.74%	4.83E-06	5.82%	4.05E-06	4.88%	4.17E-06	5.03%
Hydrogen Chloride	7.00E+00	PADEP BAT	Annual	1.30E-01	1.64E-02	2.79E-01	3.99%	2.75E-01	3.93%	3.37E-01	4.82%	2.83E-01	4.05%	2.92E-01	4.17%
Hydrogen Fluoride	5.00E+00	PA AAQS	24-hour	1.20E-01	1.51E-02	1.51E+00	30.26%	1.40E+00	27.96%	1.64E+00	32.75%	1.31E+00	26.21%	1.51E+00	30.17%
Mercury	2.40E-02	PADEP BAT	Annual	1.50E-03	1.89E-04	3.22E-03	13.42%	3.17E-03	13.22%	3.89E-03	16.22%	3.27E-03	13.62%	3.36E-03	14.02%
Nickel	3.30E-03	PADEP BAT	Annual	8.20E-07	1.03E-07	1.76E-06	0.05%	1.73E-06	0.05%	2.13E-06	0.06%	1.79E-06	0.05%	1.84E-06	0.06%
Dioxins/Furans (TEQs)	3.00E-08	PADEP BAT	Annual	1.04E-08	1.31E-09	2.23E-08	74.42%	2.20E-08	73.32%	2.70E-08	90.00%	2.27E-08	75.53%	2.33E-08	77.76%
Carbon Monoxide	1.00E+04	NAAQS Primary	8-hour	3.50E+00	4.41E-01	5.53E+01	0.55%	6.09E+01	0.61%	5.89E+01	0.59%	5.79E+01	0.58%	5.90E+01	0.59%
Carbon Monoxide	4.00E+04	NAAQS Primary	1-hour	3.50E+00	4.41E-01	8.81E+01	0.22%	9.47E+01	0.24%	9.51E+01	0.24%	9.82E+01	0.25%	9.53E+01	0.24%
Lead	9.00E-02	PADEP BAT	Annual	9.40E-07	1.18E-07	2.02E-06	0.00%	1.99E-06	0.00%	2.44E-06	0.00%	2.05E-06	0.00%	2.11E-06	0.00%
Lead	1.50E-01	NAAQS Primary/Secondary	3 month rolling[c]	9.40E-07	1.18E-07	3.32E-06	0.00%	3.07E-06	0.00%	3.42E-06	0.00%	3.46E-06	0.00%	3.48E-06	0.00%
Nitrogen Dioxide	1.88E+02	NAAQS Primary	1-hour	1.30E+00	1.64E-01	3.27E+01	17.40%	3.52E+01	18.71%	3.53E+01	18.78%	3.65E+01	19.40%	3.54E+01	18.82%
Nitrogen Dioxide	1.00E+02	NAAQS Primary/Secondary	Annual	1.30E+00	1.64E-01	2.79E+00	2.79%	2.75E+00	2.75%	3.37E+00	3.37%	2.83E+00	2.83%	2.92E+00	2.92%
PM2.5	1.20E+01	NAAQS Primary	Annual	3.90E-01	4.91E-02	8.37E-01	6.98%	8.25E-01	6.87%	1.01E+00	8.44%	8.50E-01	7.08%	8.75E-01	7.29%
PM2.5	1.50E+01	NAAQS Secondary	Annual	3.90E-01	4.91E-02	8.37E-01	5.58%	8.25E-01	5.50%	1.01E+00	6.75%	8.50E-01	5.66%	8.75E-01	5.83%
PM2.5	3.50E+01	NAAQS Primary/Secondary	24-hour	3.90E-01	4.91E-02	4.92E+00	14.05%	4.54E+00	12.98%	5.32E+00	15.21%	4.26E+00	12.17%	4.90E+00	14.01%
PM10	1.50E+02	NAAQS Primary/Secondary	24-hour	3.90E-01	4.91E-02	4.92E+00	3.28%	4.54E+00	3.03%	5.32E+00	3.55%	4.26E+00	2.84%	4.90E+00	3.27%
Sulfur Dioxide	1.97E+02	NAAQS Primary	1-hour	1.04E+00	1.31E-01	2.62E+01	13.32%	2.81E+01	14.32%	2.82E+01	14.38%	2.92E+01	14.85%	2.83E+01	14.41%
Sulfur Dioxide	1.31E+03	NAAQS Secondary	3-hour	1.04E+00	1.31E-01	2.24E+01	1.71%	2.14E+01	1.63%	2.09E+01	1.59%	2.31E+01	1.76%	2.48E+01	1.89%

	AERMOD Model Results Maximum (beyond fenceline , 1 g/s emission rate) ($\mu g/m^3$)				
Averaging Period	2008	2009	2010	2011	2012
1-hour	199.66	214.70	215.56	222.62	216.03
3-hour	171.05	163.23	159.28	176.44	189.09
8-hour	125.38	138.11	133.67	131.34	133.89
24-hour	100.07	92.46	108.31	86.66	99.77
Month	27.99	25.90	28.83	29.21	29.36
Annual	17.04	16.78	20.60	17.29	17.80

Notes:

General note: Ambient concentrations are maximum values as determined by AERMOD without consideration of the statistical form of the NAAQS. For example, the nitrogen dioxide concentration shown is the maximum and not the 98th percentile, averaged over 3 years, as established by the NAAQS.

a - Acceptable Ambient Concentration (AAC)

PADEP BAT: PADEP's BAT Guidance for Hospital/Infectious Waste Incineration Facilities (PADEP, 1996)

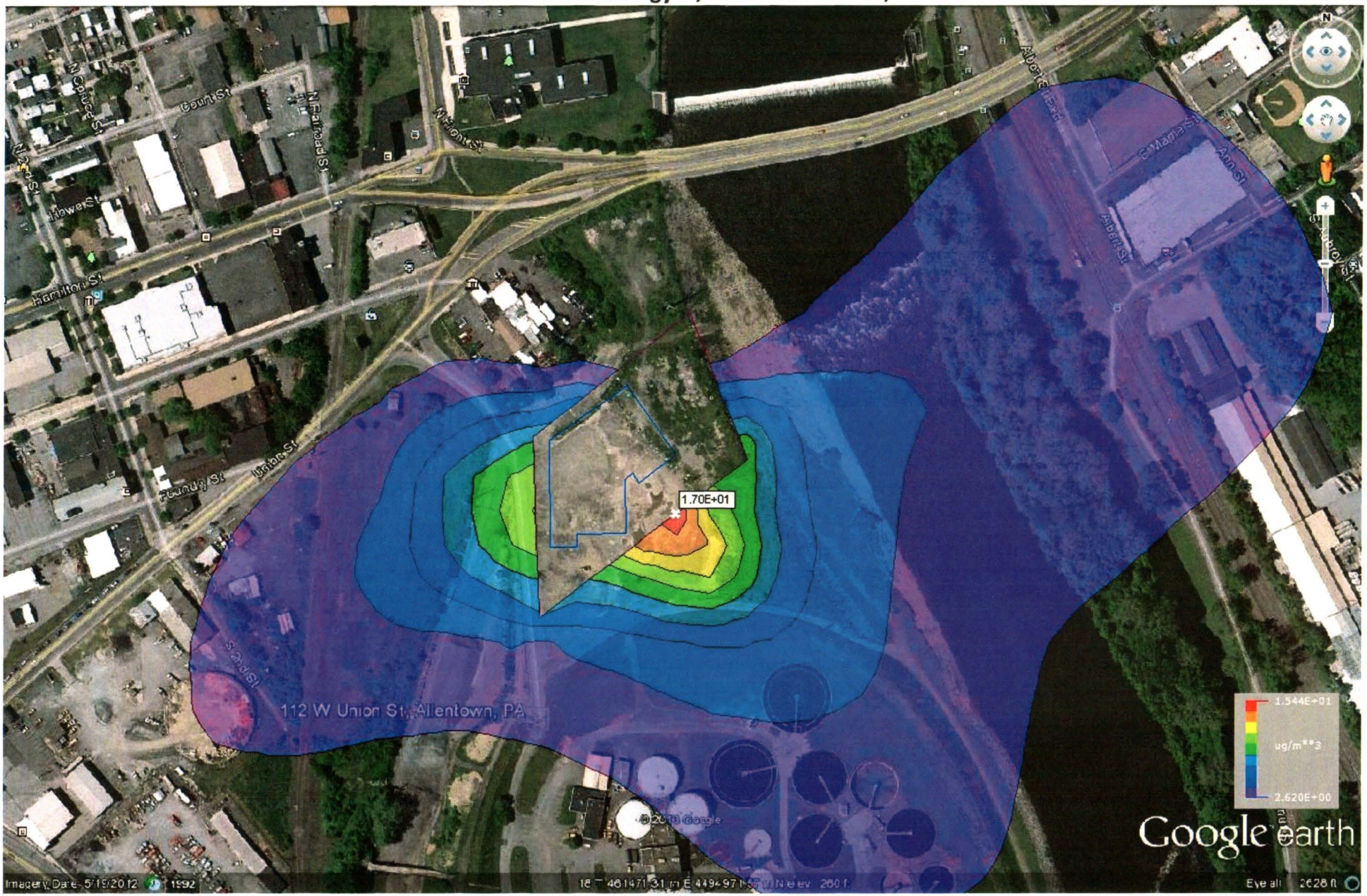
PA AAQS: 25 Pa. Code, 131.3 - Ambient Air Quality Standards

NAAQS: National Ambient Air Quality Standards for Criteria Pollutants (Primary, Primary/Secondary, or Secondary)

b - Emission rates proposed in Plan Approval application. For Benzo(a)pyrene and Dioxin/Furans (TEQs), the emission rate was assumed to be 90% of the AAC for the highest modeled year.

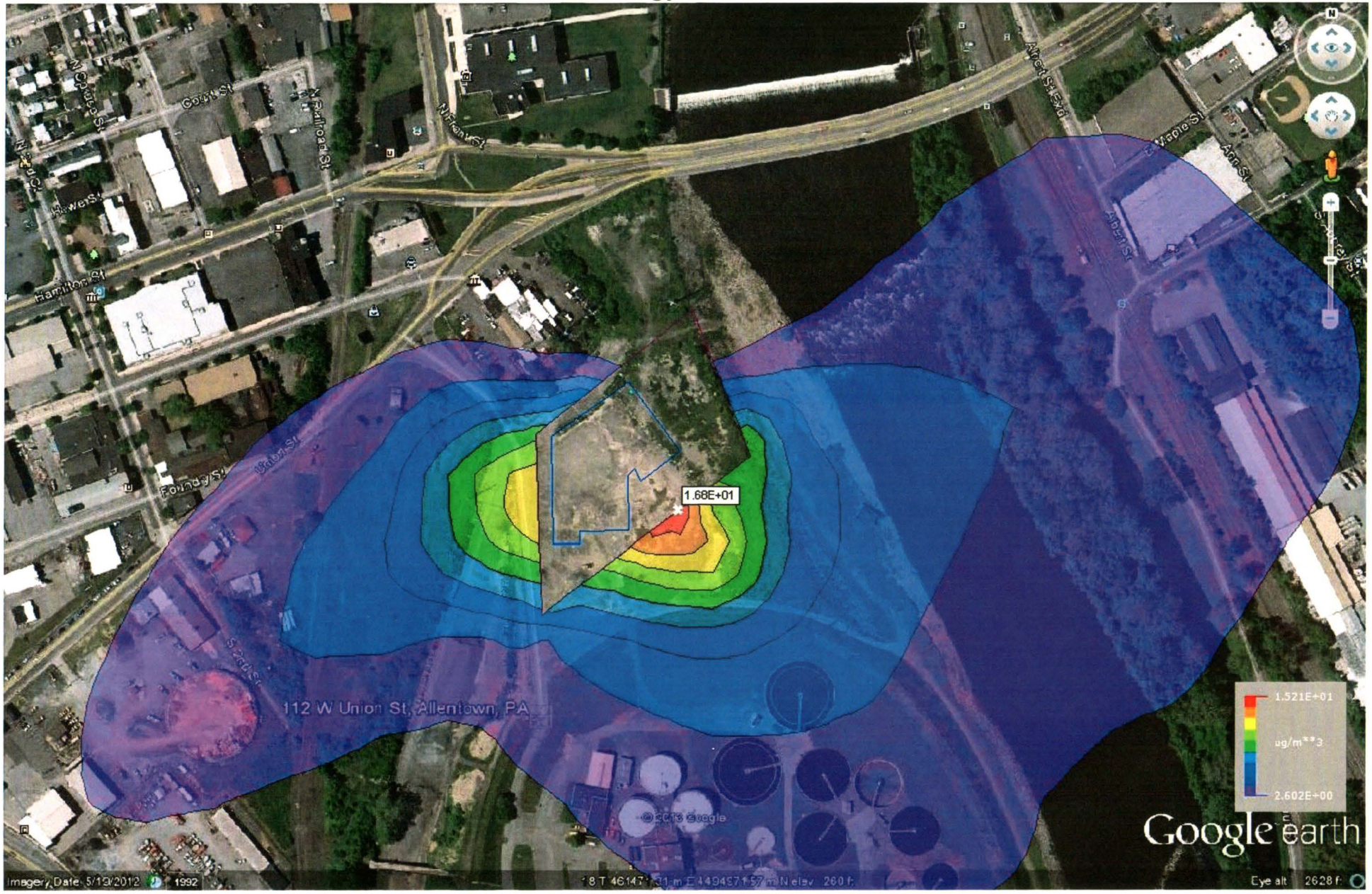
c - Monthly maximum was conservatively used in this calculation instead of 3-month rolling.

Figure 4-1 – AERMOD Results Contour Plot (2008, Annual)
Delta Thermo Energy A, LLC – Allentown, PA



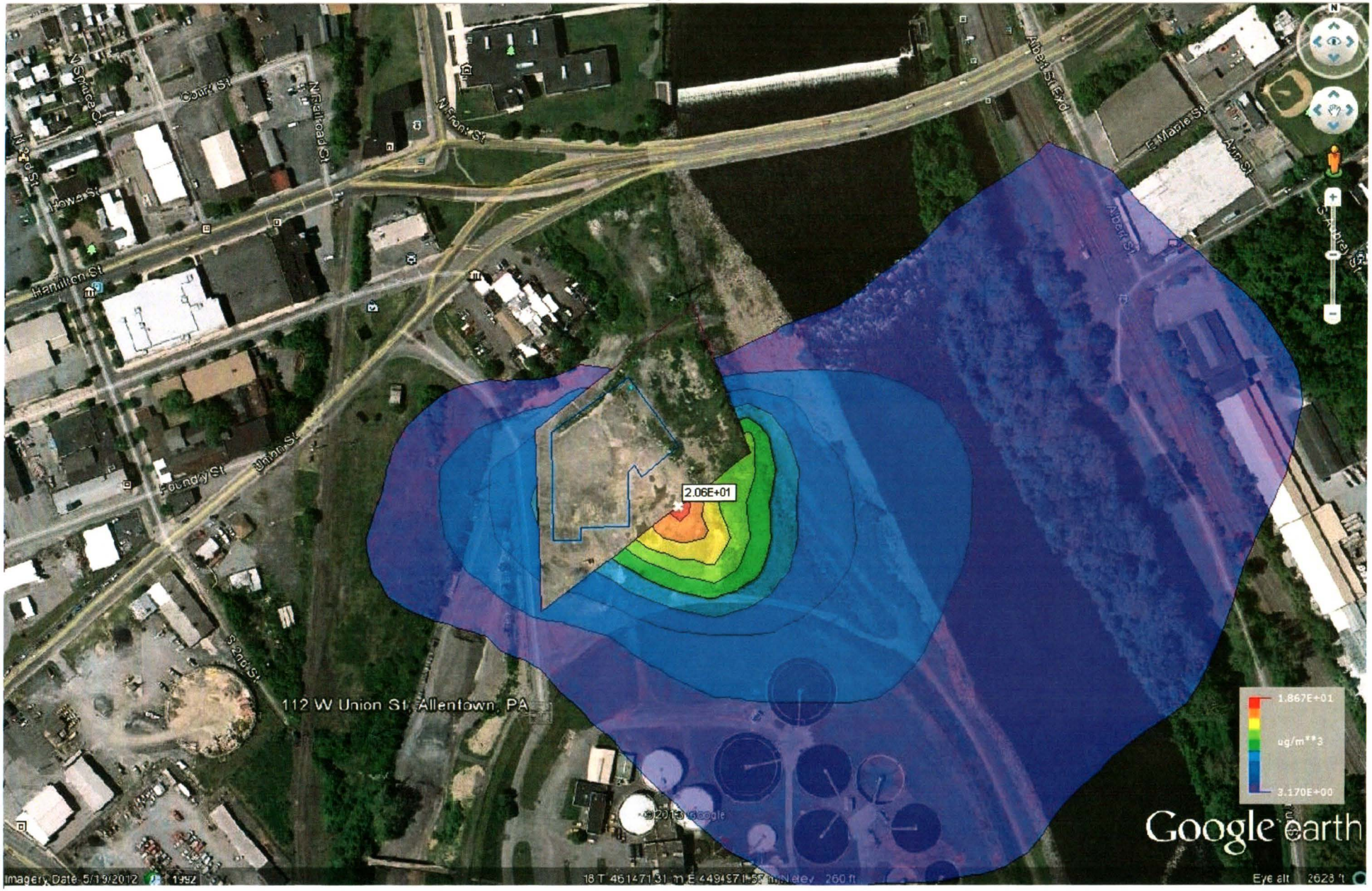
Calendar Year 2008.
Annual concentration contours displayed.

Figure 4-2 – AERMOD Results Contour Plot (2009, Annual)
Delta Thermo Energy A, LLC – Allentown, PA



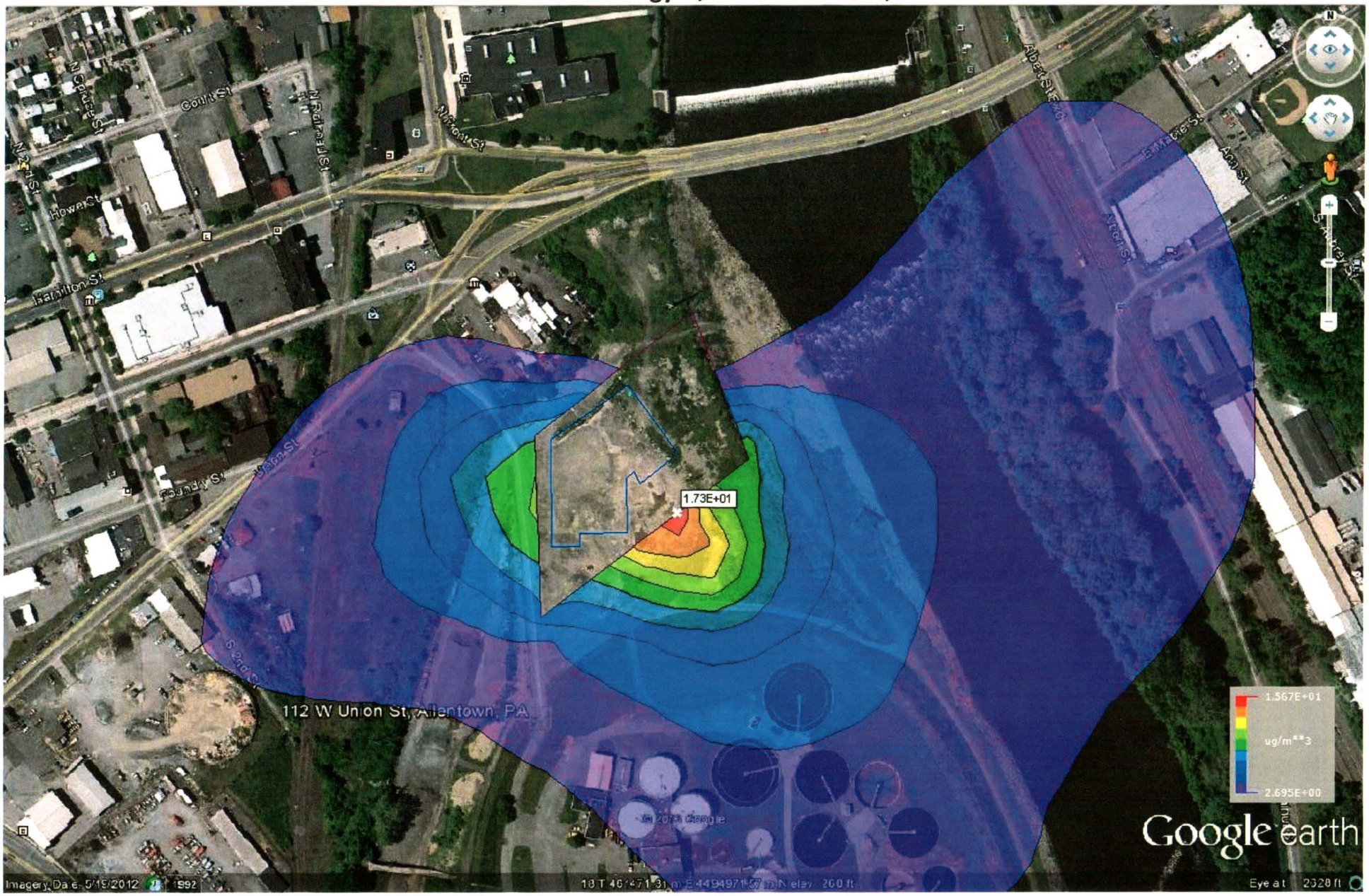
Calendar Year 2009.
Annual concentration contours displayed.

Figure 4-3 – AERMOD Results Contour Plot (2010, Annual)
Delta Thermo Energy A, LLC – Allentown, PA



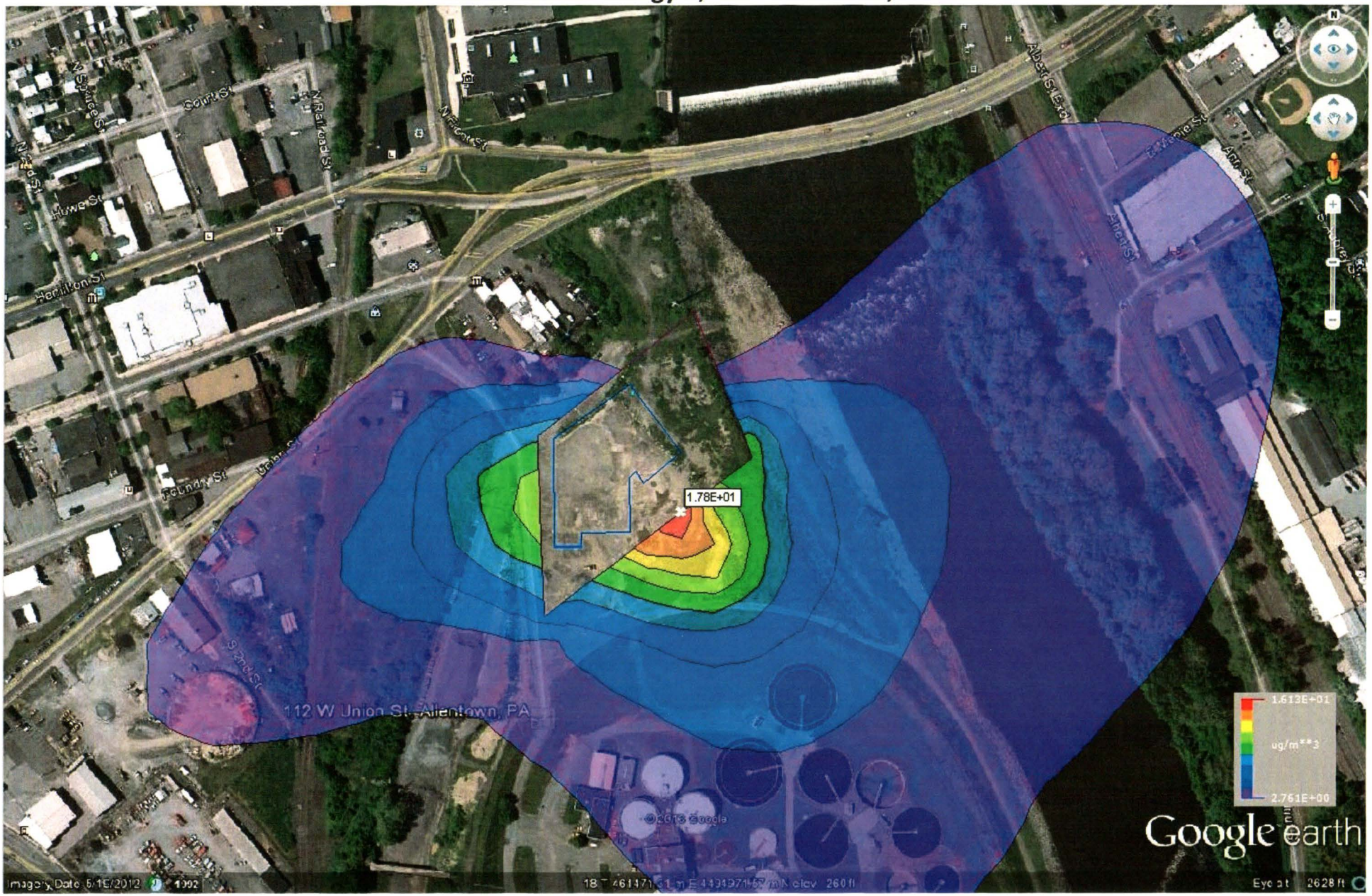
Calendar Year 2010.
Annual concentration contours displayed.

Figure 4-4 – AERMOD Results Contour Plot (2011, Annual)
Delta Thermo Energy A, LLC – Allentown, PA



Calendar Year 2011.
Annual concentration contours displayed.

Figure 4-5 – AERMOD Results Contour Plot (2012, Annual)
Delta Thermo Energy A, LLC – Allentown, PA



Calendar Year 2012.
Annual concentration contours displayed.

5.0 ELECTRONIC DATA DESCRIPTION

The modeling input/output files are included on labeled CDs in Appendix B. The zip files contain all the files used in each model run. The files were named using the following convention: DeltaThermoXX.amz, where "XX" represents the year modeled. Once unzipped, the following files are included:

AERMOD input and output files, including concentration plot files:

-AERMOD input file.TXT
-AERMOD output file.TXT
-Projection.TXT
-Polygon.XML
-Model Objects.DXF
-googleearth.JPG
-siteplan.JPG
-Plot Files – Other, All: 1-hr, 24-hr, 3-hr, 8-hr, annual, month.PLT

- Building Profile Input Program (BPIP) input and output files:
  -BPIP input file.TXT
  -BPIP output file.TXT
  -BPIP summary file.TXT

- AERMOD terrain preprocessor (AERMAP) input and output files:
  -AERMAP input file.TXT
  -AERMAP output file.TXT
  -AERMAP map detail file.TXT
  -AERMAP map parameters file.TXT
  -AERMAP receptor file.TXT
  -AERMAP source file.TXT
  -National Elevation Dataset (1/9 arc second resolution) –
  1-402113549.ZIP, 2-469433061.ZIP, 3-401231550.ZIP, 4-421552253.ZIP

- AERMOD meteorological data preprocessor (AERMET) input and output files and AERMOD-ready meteorological data files:
  -Surface Files – ABEOKX08.SFC
  ABEOKX09.SFC
  ABEOKX10.SFC
  ABEOKX11.SFC
  ABEOKX12.SFC
  -Profile Files – ABEOKX08.PFL
  ABEOKX09.PFL
  ABEOKX10.PFL
  ABEOKX11.PFL
  ABEOKX12.PFL

6.0 REFERENCES

PADEP, 1996. Section 7.6 - Air Quality Permitting Criteria Including Best Available Technology for Hospital/Infectious Waste Incineration Facilities and Section 7.5 - Air Quality Permitting Criteria Including Best Available Technology for Municipal Incinerators, "Best Available Technology and Other Permitting Criteria," PADEP Document Number 275-2101-007, February 23, 1996

APPENDIX A

SITE PLAN

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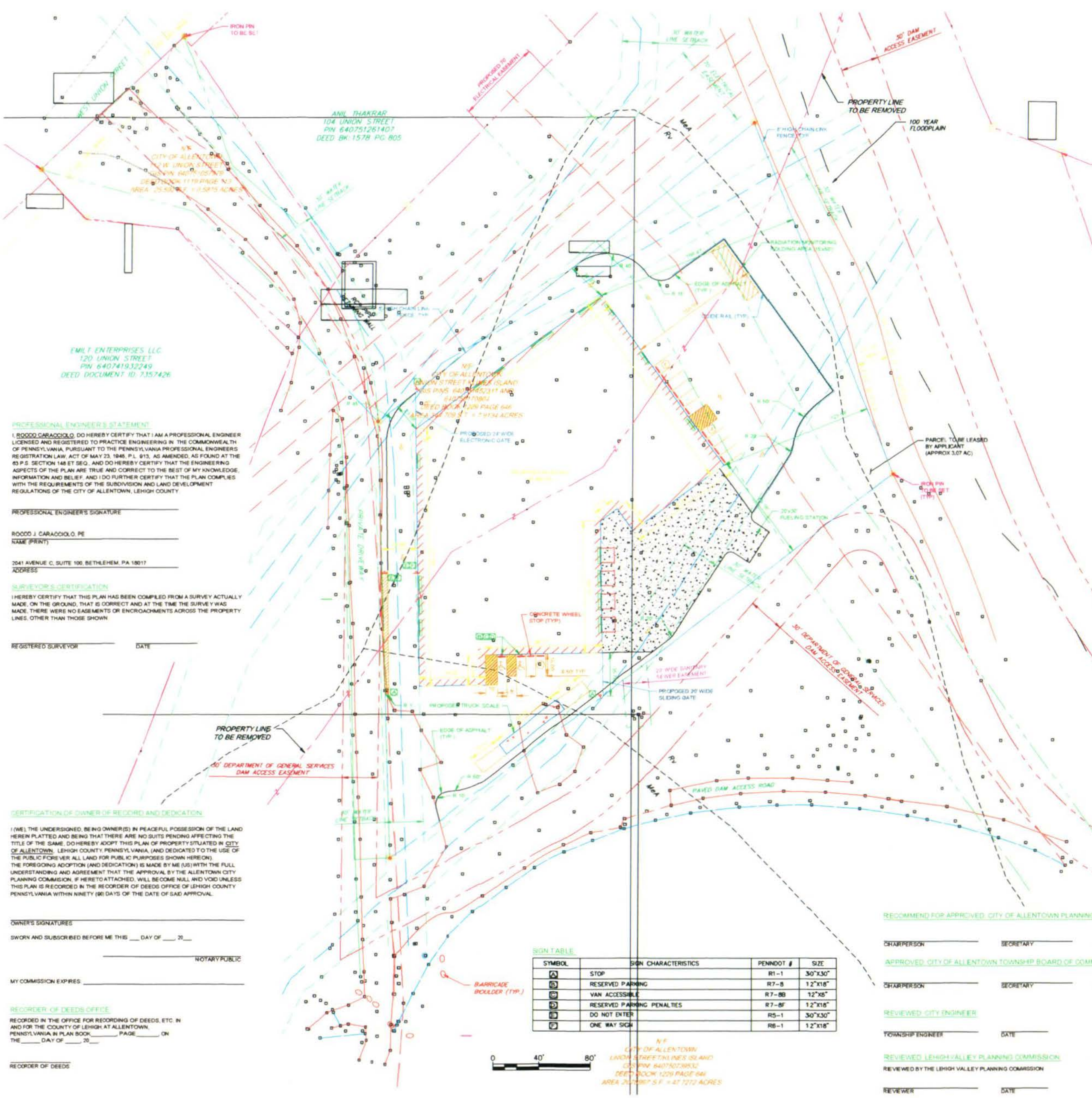

GENERAL NOTES

1. LEASEE/APPLICANT:
DELTA THERMO ENERGY, INC.
1210 NORTHBROOK CORPORATE CENTER, SUITE 100
TREVOSE, PA 19053
PHONE: (609) 423-6096

2. LOCATION: THE SUBJECT PROPERTY IS LOCATED SOUTH OF UNION STREET, WEST OF THE LEHIGH RIVER, NORTH OF THE CITY OF ALLENTOWN WASTE WATER TREATMENT PLANT, LEHIGH COUNTY, PA AND HAS A TOTAL LEASED ACREAGE OF 3.07 ACRES. THE SUBJECT PROPERTY IS LOCATED WITHIN THE "P" PARK DISTRICT.

3. THE PURPOSE OF THIS PLAN IS TO DEPICT THE CONSTRUCTION OF A PRE-ENGINEERED WASTE TO ENERGY BUILDING, ASSOCIATED PARKING, ABOVE GROUND STORMWATER DETENTION BASINS, UNDERGROUND STORMWATER DETENTION BASINS AND RELATED SITE IMPROVEMENTS.

4. THE LEHIGH COUNTY PARCEL NUMBER FOR THIS SITE IS FOUND IN DEED BOOK 1229 PAGE 644 AS SHOWN ON LEHIGH COUNTY BOARD OF ASSESSMENT APPEALS TAX PARCEL LOCATION MAP. THE PIN NUMBERS FOR THE SITE ARE 640751462311, 640750170804 AND 640750739632. THE SITE IS LOCATED IN WARD 1.

5. THE EXISTING SURVEY WAS COMPLETED BY PENNONI ASSOCIATES, INC. ON AUGUST 10, 2012.

6. SITE BENCHMARK:
LOCATION OF BENCHMARK IS AN INLET LOCATED ON THE NORTHWEST CORNER OF UNION STREET AND SOUTH 2ND STREET.

7. UTILITY NOTES:
   A. THE LOCATION OF THE EXISTING OVERHEAD UTILITIES SHOWN ON THIS PLAN HAVE BEEN TAKEN FROM FIELD OBSERVATION.
   B. COMPLETENESS OR ACCURACY OF LOCATION AND DEPTH OF UNDERGROUND UTILITIES AND STRUCTURES IS NOT GUARANTEED.
   C. IN ACCORDANCE WITH PA ACT 287 (1974), AS AMENDED, THE CONTRACTOR SHALL NOTIFY ALL UTILITIES WITHIN THE WORK AREA VIA THE PENNSYLVANIA ONE CALL SYSTEM, INC. (800-242-1776) A MINIMUM OF 3 WORKING DAYS BEFORE THE START OF EXCAVATION.
   D. THE CONTRACTOR SHALL VERIFY LOCATIONS AND DEPTHS OF ALL UNDERGROUND UTILITIES AND STRUCTURES BEFORE THE START OF WORK.
   E. IF CONFLICTS ARE FOUND THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER AND DESIGN ENGINEER FOR INSTRUCTION BEFORE PROCEEDING WITH WORK.

8. AS SHOWN ON THE FLOOD INSURANCE RATE MAPS FOR LEHIGH COUNTY, PA, MAP #42077C0262F (PANEL 262 OF 340) EFFECTIVE DATE JULY 16, 2004, THE SITE LIES WITHIN "ZONE X" DEFINED AS AREAS DETERMINED TO BE OUTSIDE THE 500 YEAR FLOODPLAIN.

9. THE PROPOSED SITE WILL BE SERVICED BY PUBLIC WATER SUPPLY AND PUBLIC SEWER THROUGH THE CITY OF ALLENTOWN.

10. ALL RADII SHOWN ARE 5 FT UNLESS OTHERWISE SPECIFIED.

11. ALL PROPERTY CORNERS TO BE MARKED APPROPRIATELY.

12. RUNOFF FROM PROPOSED IMPERVIOUS AREAS CANNOT BE DISCHARGED INTO THE SANITARY SEWER SYSTEMS NOR ONTO ADJOINING PROPERTIES. THEREFOR, RUNOFF SHALL BE DIRECTED TO THE ADJOINING PUBLIC RIGHTS-OF-WAY.

13. ALL CITY PERMITS MUST BE OBTAINED PRIOR TO THE START OF CONSTRUCTION.

LEGEND

- PROPERTY LINE
- PROPERTY LINE TO BE REMOVED
- EX PROPERTY CORNER FOUND
- EX CONCRETE MONUMENT
- ADJOINING PROPERTY LINE
- EX WATER EASEMENT
- EX ELECTRICAL EASEMENT
- EX ACCESS EASEMENT
- EX CURB
- EX EDGE OF PAVEMENT
- EX EDGE OF GRAVEL
- EX WALL
- EX SIGN
- EX LANDSCAPING
- EX TREE ROW
- EX MINOR CONTOUR
- EX MAJOR CONTOUR
- EX STORM SEWER LINES
- EX STORMWATER MANHOLE
- EX STORM SEWER INLET
- EX OVERHEAD ELECTRICAL LINES
- EX ELECTRICAL LINES
- EX UTILITY POLE
- EX WATER LINES
- EX WATER MANHOLE
- EX FIRE HYDRANT
- EX MONITORING WELL
- EX SANITARY SEWER LINES
- EX SANITARY MANHOLE
- EX SANITARY CLEAN OUT
- EX NATURAL GAS LINES
- BORING HOLES
- SOILS BOUNDARY LINES
- SOILS TEXT
- PROPOSED PROPERTY LINE
- PROPOSED RIGHT-OF-WAY
- PROPOSED IRON PIN
- PROPOSED CONCRETE MONUMENT
- PROPOSED GUIDE RAIL
- PROPOSED EASEMENT
- PROPOSED BUILDING
- PROPOSED EDGE OF PAVEMENT
- PROPOSED HEAVY DUTY CONCRETE
- PROPOSED GORE STRIPING
- PROPOSED CONCRETE WHEEL STOP
- PROPOSED SIGN
- PROPOSED FINISHED FLOOR ELEVATION
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED STORM SEWER
- PROPOSED STORM SEWER MANHOLE
- PROPOSED INLET
- PROPOSED ELECTRICAL
- PROPOSED OVERHEAD ELECTRIC
- PROPOSED UTILITY POLE
- PROPOSED WATER LINES
- PROPOSED FIRE HYDRANT
- PROPOSED WATER VALVE
- PROPOSED FIRE PROTECTION
- PROPOSED SANITARY SEWER LINES

PROFESSIONAL ENGINEER'S STATEMENT

I, ROCCO CARACCIOLO, DO HEREBY CERTIFY THAT I AM A PROFESSIONAL ENGINEER LICENSED AND REGISTERED TO PRACTICE ENGINEERING IN THE COMMONWEALTH OF PENNSYLVANIA, PURSUANT TO THE PENNSYLVANIA PROFESSIONAL ENGINEERS REGISTRATION LAW, ACT OF MAY 23, 1945, P.L. 913, AS AMENDED, AS FOUND AT THE 63 P.S. SECTION 148 ET SEQ., AND DO HEREBY CERTIFY THAT THE ENGINEERING ASPECTS OF THE PLAN ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF, AND I DO FURTHER CERTIFY THAT THE PLAN COMPLIES WITH THE REQUIREMENTS OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS OF THE CITY OF ALLENTOWN, LEHIGH COUNTY.

____
PROFESSIONAL ENGINEER'S SIGNATURE

ROCCO J. CARACCIOLO, PE
NAME (PRINT)

2041 AVENUE C, SUITE 100, BETHLEHEM, PA 18017
ADDRESS

SURVEYOR'S CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN COMPILED FROM A SURVEY ACTUALLY MADE, ON THE GROUND, THAT IS CORRECT AND AT THE TIME THE SURVEY WAS MADE, THERE WERE NO EASEMENTS OR ENCROACHMENTS ACROSS THE PROPERTY LINES, OTHER THAN THOSE SHOWN.

______________________ REGISTERED SURVEYOR ______________ DATE

CERTIFICATION OF OWNER OF RECORD AND DEDICATION

I (WE), THE UNDERSIGNED, BEING OWNER(S) IN PEACEFUL POSSESSION OF THE LAND HEREIN PLATTED AND BEING THAT THERE ARE NO SUITS PENDING AFFECTING THE TITLE OF THE SAME, DO HEREBY ADOPT THIS PLAN OF PROPERTY SITUATED IN CITY OF ALLENTOWN, LEHIGH COUNTY, PENNSYLVANIA, (AND DEDICATED TO THE USE OF THE PUBLIC FOREVER ALL LAND FOR PUBLIC PURPOSES SHOWN HEREON).
THE FOREGOING ADOPTION (AND DEDICATION) IS MADE BY ME (US) WITH THE FULL UNDERSTANDING AND AGREEMENT THAT THE APPROVAL BY THE ALLENTOWN CITY PLANNING COMMISION, IF HERETO ATTACHED, WILL BECOME NULL AND VOID UNLESS THIS PLAN IS RECORDED IN THE RECORDER OF DEEDS OFFICE OF LEHIGH COUNTY PENNSYLVANIA WITHIN NINETY (90) DAYS OF THE DATE OF SAID APPROVAL.

____
OWNER'S SIGNATURES

SWORN AND SUBSCRIBED BEFORE ME THIS ___ DAY OF ____, 20__

______________________ NOTARY PUBLIC

MY COMMISSION EXPIRES ______________________

RECORDER OF DEEDS OFFICE

RECORDED IN THE OFFICE FOR RECORDING OF DEEDS, ETC. IN AND FOR THE COUNTY OF LEHIGH AT ALLENTOWN, PENNSYLVANIA IN PLAN BOOK________, PAGE_______, ON THE______ DAY OF _____, 20___

____
RECORDER OF DEEDS

SIGN TABLE

SYMBOL	SIGN CHARACTERISTICS	PENNDOT #	SIZE
	STOP	R1-1	30"X30"
	RESERVED PARKING	R7-8	12"X18"
	VAN ACCESSIBLE	R7-8B	12"X6"
	RESERVED PARKING PENALTIES	R7-8F	12"X18"
	DO NOT ENTER	R5-1	30"X30"
	ONE WAY SIGN	R6-1	12"X18"

RECOMMEND FOR APPROVED: CITY OF ALLENTOWN PLANNING COMMISSION

CHAIRPERSON ______ SECRETARY ______ DATE ______

APPROVED: CITY OF ALLENTOWN TOWNSHIP BOARD OF COMMISSIONERS

CHAIRPERSON ______ SECRETARY ______ DATE ______

REVIEWED: CITY ENGINEER

TOWNSHIP ENGINEER ______ DATE ______

REVIEWED: LEHIGH VALLEY PLANNING COMMISSION

REVIEWED BY THE LEHIGH VALLEY PLANNING COMMISSION

REVIEWER ______ DATE ______

Pennoni

Engineers • Surveyors • Planners • Landscape Architects

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR AND OWNER MUST BE NOTIFIED OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK

DATE	NO.	REVISIONS	BY

DTE ALLENTOWN

RECORD PLAN
PRELIMINARY/FINAL PLAN

2041 Avenue C, Suite 100
Bethlehem, PA 18017 – 610.231.0600

Pennoni Associates Inc.

PNTX 1204

CS1001

APPENDIX B

ELECTRONIC MODELING AND METEOROLOGICAL DATA