

Belch, Debra

From: Belch, Debra
Sent: Tuesday, September 24, 2013 10:22 AM
To: Sychtyz, Mary Ellen
Subject: FW: Delta Thermo Response
Attachments: 20130918143015042.pdf

-----Original Message-----

From: McGurk, Tracey
Sent: Monday, September 23, 2013 4:01 PM
To: Belch, Debra
Subject: FW: Delta Thermo Response

We got this last for Delta Thermo. I was just going through my earlier emails and saw there is a file review on Friday. If you want to print the email and attachment for the file review that would be easy, or if you want me to do it and send it down, just let me know.

Tracey McGurk | Facilities Supervisor
Department of Environmental Protection | Waste Management Program Northeast Regional Office
2 Public Square | Wilkes-Barre, PA 18701
Phone: 570.826.2076 | Fax: 570.826.5448
www.depweb.state.pa.us

-----Original Message-----

From: Daugherty, Stacy
Sent: Wednesday, September 18, 2013 2:32 PM
To: McGurk, Tracey; Houseal, Linda
Subject: Delta Thermo Response

Hi Ladies,

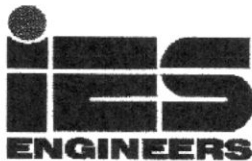
I attached the latest response from Delta Thermo for your review. Can you please send me comments by early next week? If it will take longer, just let me know. Thanks!

Stacy

Stacy L. Daugherty | Environmental Chemist Department of Environmental Protection | Bureau of Waste Management
Rachel Carson State Office Building
400 Market Street | Harrisburg, PA 17101
Phone: 717.783.9467 | Fax: 717.787.1904
www.depweb.state.pa.us

-----Original Message-----

From: eparlrp02@pa.gov [mailto:eparlrp02@pa.gov]
Sent: Wednesday, September 18, 2013 2:30 PM



SEP 17 2013

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

September 16, 2013

E-MAIL & EXPRESS MAIL

FedEx No. 7966 9385 3370

Ms. Stacy L. Daugherty
Environmental Chemist
Permits Section, Bureau of Waste Management
Pennsylvania Department of Environmental Protection
Rachel Carson State Office Building
400 Market Street
Harrisburg, PA 17101

Subject: Response to 2nd Technical Deficiency Letter
Delta Thermo Energy, A, LLC
City of Allentown, Lehigh County, Pennsylvania
APS ID NO. 799226, AUTH ID NO. 955622
IES Project No. EV120894.03

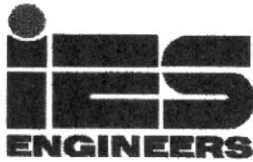
Dear Ms. Daugherty:

On behalf of Delta Thermo Energy, A, LLC (DTE), IES Engineers (IES) is pleased to provide the following responses to the Department's comments in its letter dated September 10, 2013. Our responses to the Department's comments are listed below in bold in the same order in which they were presented. We have repeated the Department's comment before our response for ease.

Department Comments:

1. The process description indicated a standby service agreement was in place between Delta Thermo Energy, A, LLC and Sustainable Waste Solutions, LLC. This agreement must also be in compliance with the Lehigh County Solid Waste Management Plan. Please provide documentation showing the agreement complies with the plan.

Response: Sustainable Waste Solutions, LLC (SWS) operates a solid waste collection business in the Commonwealth of Pennsylvania pursuant to permits issued by the Pennsylvania Department of Environmental Protection (Department). DTE has entered into a Standby Services Agreement with SWS to provide collection and disposal services to its Allentown facility whenever it is not operating. All of the materials collected from the facility by SWS will be disposed of properly at landfills or waste-to-energy facilities licensed by the Department.



Ms. Stacy L. Daugherty
September 16, 2013
Page 2

SWS is currently collecting and disposing of waste in Lehigh County. The Lehigh County Solid Waste Plan is currently under revision and DTE has requested to be included in the revised plan. It is our understanding that haulers do not need to be included in the County's revised plan. Under the agreement with SWS, the waste to be collected from the facility belongs to DTE, which will already be part of the County's Plan. Therefore, we believe that the Standby Services Agreement with SWS is in compliance with the County's Plan.

2. The process description, page 6, includes a request to include the beneficial use of bottom ash as part of the general permit. Because the process is not yet in operation, chemical data and physical characteristics of the ash cannot be determined. The Department requests that this use be withdrawn until data is available to make a decision on the potential beneficial uses of the bottom ash. The applicant may request to modify the general permit when information is available to support this claim.

Response: DTE has revised the process description on page 6 to withdraw the request to utilize the bottom ash beneficially until sufficient analytical data are available to demonstrate that this use meets the Department's requirements.

3. Form X – There are three additional comments for revisions to the radiation action plan:
 1. Page 3 should include a comment that tritium signs can only be detected visually.

Response: DTE has revised page 3 of the radiation action plan to include a statement that tritium-containing objects, such as signs, can only be detected visually.

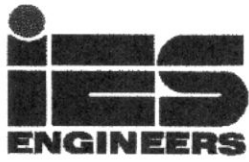
2. Page 12, Section 6.5 should include a comment that DOT has limits on Radium 226, 228, and other TENORM isotopes based on specific activity (pCi/g).

Response: DTE has included a comment in 6.5.1.4 regarding DOT limits.

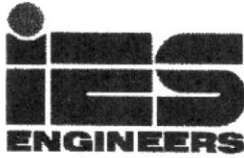
3. Page 13, Section 6.6 – DTE may want to establish a limit in $\mu\text{R/hr}$ because not all K-40 is NORM; it may be considered TENORM if concentrated.

Response: DTE has revised Section 6.6.1 to include limits on K-40 as TENORM.

4. Bonding Worksheets – The bond calculations indicate that the maximum volume of MSW to be removed is 600 tons and sludge is 50 tons. However, Section 2, page 4 of the



ATTACHMENT 15
RADIATION ACTION PLAN



respectively.) In the event such limits are exceeded, DTE will contact its consulting firm for guidance, prior to submission of DOT SP-11406.

6.5.1.5 Complete the DOT SP-11406 exemption form and FAX it to the Department. The waste cannot leave the site until a signed form is received from the Department.

6.5.1.6 Once an approved DOT SP-11406 exemption permit is received from the Department, the vehicle may be released.

6.5.1.6.1 The EHS Director or designee shall notify the waste owner and forward a copy of the DOT SP-11406 exemption permit.

6.5.2 If Driver leaves site without approved DOT SP-11406 permit

6.5.2.1 In the event a driver attempts or succeeds in driving a contaminated vehicle or vehicle containing contamination off site without Department authorization and a DOT SP-11406 form, notify the Pennsylvania State Police and the Department.

6.5.2.2 Advise them of the following:

- Nature of event
- Description (make, model, color, name) and license number of the truck
- Time vehicle left site, direction of travel, and destination if known

6.6 Disposition of Waste

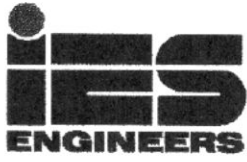
After further characterization and radionuclide identification and in consultation with the DEP Area Health Physicist, DTE may choose to:

6.6.1 Accept the waste if it is low level NORM (naturally occurring radioactive material) containing potassium compounds or if further analysis shows potassium-40 as TENORM with a the volume not exceeding 1 cubic meter and the gamma radiation level at a distance of 5 cm not exceeding 0.5 $\mu\text{Sv/hr}$ (50 $\mu\text{rem/hr}$) above background.

6.6.2 Process or dispose of radioactive material from medical procedures with half-life of 65 days or less upon authorization from the Department's Director of the Bureau of Radiation Protection

6.6.3 Return to manufacturer, when appropriate, or recover and forward to an approved landfill, certain consumer products, upon the written approval of the Department.

6.6.4 If the load is to be rejected, contact the Department for a DOT Exemption Form.



ATTACHMENT 16

BONDING WORKSHEETS – PROCESSING FACILITY

Date Prepared

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

I.D. Number

BONDING WORKSHEET A WASTE PROCESSING DECONTAMINATION

How do I start? Select a likely "worst case" scenario where you would have a maximum amount of the facility open and in need of closure. Provide a description of the scenario with references to site development stages:

Closure costs assume 640 tons of unprocessed MSW and 62 tons of sewage sludge. The receiving bunker, tipping floor, RRS, and CCC will require decontamination. Cost also assumes that 10 tons of bottom ash and 10 tons of fly ash will need to be disposed of. Closure of the wastewater treatment system will require disposal of 40,000 gallons of wastewater and 10 tons of wastewater treatment sludge plus decontamination.

- | | |
|--|----------------------------------|
| 1. Maximum volume of waste to be removed from storage, tipping floor and equipment.: | <u>See Attachment</u> CY |
| 2. Unit cost to dispose of waste off-site (this should include, but not be limited to removal, transportation and disposal costs). | <u>See Attachment</u> \$/CY |
| 3. Volume of pipes, lines and equipment of the total processing system to be decontaminated | <u>See Attachment</u> CY |
| 4. Unit cost to decontaminate equipment. | <u>See Attachment</u> \$/CY |
| 5. Area of exposed surfaces to be decontaminated (this should include but not be limited to tipping floor, walls, etc.) | <u>See Attachment</u> sq. ft. |
| 6. Unit cost to decontaminate surfaces. | <u>See Attachment</u> \$/sq. ft. |
| 7. Volume of waste generated during decontamination. | <u>See Attachment</u> CY |
| 8. Unit cost to dispose of decontamination wastes | <u>See Attachment</u> \$/CY |
| 9. Number of verification samples needed to verify decontamination. | <u>See Attachment</u> |
| 10. Unit cost to sample, analyze and report results (this should include any transportation and/or shipping costs) | <u>See Attachment</u> \$/sample |
| 11. Estimate volume of process residuals (wastewater, etc.) | <u>See Attachment</u> CY |
| 12. Cost for facility maintenance: | <u>25,000</u> LS |
| 13. Engineering and QA/QC costs | <u>50,000</u> LS |
| 14. Cost Summary | |
| a. Waste Removal (line 1 x line 2) | \$ <u>69,870</u> |
| b. Equipment decontamination (line 3 x line 4) | \$ <u>59,605</u> |
| c. Surface decontamination (line 5 x line 6) | \$ <u>Included in b.</u> |
| d. Decontamination waste disposal (line 7 x line 8) | \$ <u>Included in b.</u> |
| e. Sampling and analysis (line 9 x line 10) | \$ <u>45,000</u> |
| f. Process residual disposal (line 11 x line 8) | \$ <u>25,100</u> |
| g. Maintenance (line 12) | \$ <u>25,000</u> |
| h. QA/QC (line 13) | \$ <u>50,000</u> |

Total \$ 274,575

(Place this total on Summary Cost Worksheet – line 1)

Date Prepared

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

I.D. Number

**BONDING WORKSHEET E
SUMMARY COST WORKSHEET****Cost Summary – Waste Processing**

1. Decontaminating the Facility	\$ <u>274,575</u>
2. Surface Water Monitoring	\$ <u>N/A</u>
3. Groundwater Monitoring	\$ <u>N/A</u>
4. Other Monitoring	\$ <u>N/A</u>
5. Other Costs ¹	\$ <u>N/A</u>
Subtotal	\$ <u>274,575</u>

Inflation

6. Inflation rate (projected inflation for the next three years based on the inflation for the prior three years).	<u>3.9%</u>
7. Inflation cost for facility (subtotal x line 6)	\$ <u>10,708</u>

Contingency and administrative fees

8. Administrative fees (10%) (subtotal x 0.1)	\$ <u>41,186</u>
9. Contingency fee amount (subtotal x rate of contingency fee from Table 1)	\$ <u>34,322</u>

Total (subtotal + line 7 + line 8 + line 9) **\$ 360,792**

¹ You should include any costs that would be incurred by the Department, but were not included in these sheets. Provide separate sheets for documentation.

CLOSURE BOND CALCULATIONS

85 Disposal (\$/ton), includes trucking
 \$ 850.00 Total Disposal of Fly Ash

2b. Dispose of Bottom Ash

40 tons estimated
 85 Disposal (\$/ton), includes trucking
 \$ 3,400.00 Total Disposal of Bottom Ash

Ash Disposal Summary

\$	850.00	3a.	Fly Ash Disposal
\$	3,400.00	3b.	Bottom Ash Disposal
\$	4,250.00		Total Ash Disposal

3. Wastewater Disposal

3a. Dispose of Untreated Wastewater

40000 gallons, estimated
 0.5 Disposal (\$/gallon), includes trucking
 \$ 20,000.00 Total Disposal of Wastewater

3b. Dispose of Wastewater Sludge

10 tons estimated
 85 Disposal (\$/ton), includes trucking
 \$ 850.00 Total Disposal of Wastewater Sludge

Wastewater Disposal Summary

\$	20,000.00	4a.	Untreated Wastewater Disposal
\$	850.00	4b.	Wastewater Sludge Disposal
\$	20,850.00		Wastewater Disposal

4. Wastewater Treatment System Cleaning (Decontamination)

\$	1,500.00	3 Man Cleaning Crew/day - Steam Power Wash
		7 Days to clean Eq. Tank and Chem Dosing Tanks (3 Man Crew)
\$	10,500.00	To Clean Tanks
		5000 gals to clean Tanks
		1 Trucks @ 5000 gals
\$	2,350.00	Truck(disp + trans)
\$	2,350.00	Total Disposal Pad Flushings
		7 Days to clean reactors, piping and lamella solid separator
\$	10,500.00	To clean receiving CCC
		5000 gals to clean reactors, piping and lamella solid separators
		1 Trucks @ 5000 gals
\$	2,350.00	Truck(disp + trans)
\$	2,350.00	Total Disposal Tank Flushings
\$	25,700.00	Total Wastewater Treatment System Cleaning

Testing (for Decontamination completeness)

		10 Tests - Testing of Cleaning water
\$	1,200.00	per test
\$	18,000.00	Total Testing costs using 150% for 1/2 sample repeat testing

\$	43,700.00	Total Decontamination of Wastewater Treatment System
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Summary for Plant

\$	130,775	1. Removal of Unprocessed Waste
\$	4,250	2. Ash Disposal
\$	20,850	3. Wastewater Disposal
\$	43,700	4. Waste Treatment System Decontamination
\$	50,000	Engineering QA/QC
\$	25,000	Facility Maintenance
\$	274,575	Total Site

Inflation

\$10,708	3.90%
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2013 Contingency Fee @12.5%

\$	34,322
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2013 Administrative Fee @ 15%

\$	41,186	Includes 10% for administration and 5% for Project Management
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2013 Estimate of Total Closure Bond

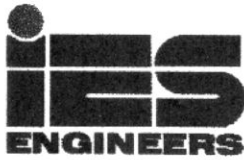
\$	360,792
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To: Daugherty, Stacy
Subject: Message from "EPARLRP02"

This E-mail was sent from "EPARLRP02" (Aficio MP 6001).

Scan Date: 09.18.2013 14:30:14 (-0400)

Queries to: eparlrp02@pa.gov



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

NEW GENERAL SOLID WASTE PERMIT APPLICATION

**PRODUCTION OF RENEWABLE CLEAN FUEL AND ELECTRICITY
FROM MUNICIPAL SOLID WASTE AND SEWAGE SLUDGE AS WELL AS
RECYCLABLE MATERIALS**

ENERGY PRODUCTION PROCESS

**DELTA THERMO ENERGY, A, LLC
PROJECT LOCATION: 112 W. UNION STREET ALLENTOWN, PENNSYLVANIA**

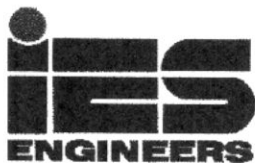
SUBMITTED TO:

**PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
CENTRAL OFFICE
14th FLOOR RACHEL CARSON STATE OFFICE BUILDING
P.O. BOX 8472
HARRISBURG, PENNSYLVANIA 17105-8472**

SUBMITTED BY:

**IES ENGINEERS
1720 WALTON ROAD
BLUE BELL, PENNSYLVANIA 19422**

**IES PROJECT NO. EV120894.03
DECEMBER 2012
REVISED MAY 2013
REVISED SEPTEMBER 2013**



Ms. Stacy L. Daugherty
September 16, 2013
Page 3

process description indicates 640 tons of MSW and 62 tons of sludge can be stored. The bond calculations must be increased to match the volumes listed in the process description.

Response: DTE has revised the bond calculations to be consistent with the process description.

The relevant pages of the application have been revised to reflect the responses presented in this letter. Only the revised pages have been included with this response.

We look forward to the issuance of the draft Solid Waste Permit promptly so that we can provide comments on it before the issuance of the final permit. Should you have any questions in the meantime, please feel free to contact me or Mr. Robert Van Naarden at (215) 809-1139.

Very truly yours,

Michael J. Tucci /c/
Michael J. Tucci, P.E.
Project Manager

Enclosures

cc: R. Van Naarden, DTE
M. Bonilla, DTE
A. Soni, IES



Attachment - Closure Bond Calculations 2013

1. Removal of unprocessed MSW and Sewage Sludge

1a. Removal of Raw MSW

640 tons
 \$ 85.00 Offsite Disposal Cost (\$/ton), includes trucking
 \$ 54,400.00 Total Disposal

1b. Removal of Sludge from Site

62 tons
 \$ 85.00 Offsite Disposal Cost (\$/ton), includes trucking
 \$ 5,270.00 Total Disposal

1c. Removal of Fuel Product (PF)

120 tons
 \$ 85.00 Offsite Disposal Cost (\$/ton), includes trucking
 \$ 10,200.00 Total Disposal

1d. Tipping Floor/Receiving Bunker Cleaning (Decontamination)

\$ 1,500.00 3 Man Cleaning Crew/day - Steam Power Wash
 5 Days to clean Tipping Floor (3 Man Crew)
 \$ 7,500.00 To clean pad
 3000 gals to clean pad
 0.6 Trucks @ 5000 gals
 \$ 2,350.00 Truck(disposal + trans)
 \$ 1,410.00 Total Disposal Pad Flushings
 5 Days to clean Receiving Bunker (3 Man Crew)
 \$ 7,500.00 To clean receiving bunker
 5000 gals to clean receiving bunker
 1 Trucks @ 5000 gals
 \$ 2,350.00 Truck(disposal + trans)
 \$ 2,350.00 Total Disposal Tank Flushings
 \$ 16,760.00 Total Tipping floor/Receiving Bunker Cleaning

1e. RRS (2) & CCC (5) Cleaning (Decontamination)

\$ 1,500.00 3 Man Cleaning Crew/day - Steam Power Wash
 4 Days to clean RRS (3 Man Crew) - 2 days per RRS
 \$ 6,000.00 To clean RRS
 1000 gals to clean RRS
 0.2 Trucks @ 5000 gals
 \$ 2,350.00 Truck(disposal + trans)
 \$ 470.00 Total Disposal Pad Flushings
 5 Days to clean CCC (3 Man Crew) - 1 day per CCC
 \$ 7,500.00 To clean receiving CCC
 2500 gals to clean CCC
 0.5 Trucks @ 5000 gals
 \$ 2,350.00 Truck(disposal + trans)
 \$ 1,175.00 Total Disposal Tank Flushings
 \$ 15,145.00 Total RRS/CCC Cleaning

Testing (for Decontamination completeness)

15 Testing of Clearing water (4 test each for tipping floor and bunker + 7 tests total for RRS & CCC)
 \$ 1,200.00 per test
 \$ 27,000.00 Total Testing costs using 150% for 1/2 sample repeat testing
 \$ 60,905.00 Total Decontamination of Tipping floor, bunker, RRS, and CCC, including Analytical Testing

Removal of Unprocessed Waste Summary

\$	69,870.00	1a & 1b	Disposal of Unprocessed Waste
\$	60,905.00	1d & 1e	Decontamination and testing
\$	130,775.00	Total for Removal of Unprocessed Waste	

2. Ash Disposal

2a. Dispose of Fly Ash

10 tons estimated

6.3.1.3.3 If the driver is not employed by Delta Thermo Energy, the EHS Director or designee shall also provide the Action Level 2 Information Form to the driver.

6.3.1.4 In order to maintain exposure to radiation as-low-as-reasonably-achievable (ALARA), no contamination wipes or further characterization will occur until the PADEP Health Physicist has been contacted DTE should also contact their radiation consulting firm at this point.

6.4 Characterization of the waste and radionuclide identification

If waste characterization is required, DTE will contact their radiation consulting firm.

6.5 DOT Exemption

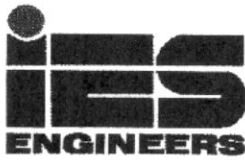
6.5.1 All waste will be stored in the vehicle while awaiting a DOT SP-11406 exemption permit. The vehicle will remain in the survey/holding area until an approved DOT SP-11406 exemption permit is received.

6.5.1.1 If the exposure rate does not exceed 500 $\mu\text{R/hr}$ at the surface of the vehicle, post the vehicle with "Caution – Radioactive Material" signs.

6.5.1.2 If the exposure rate exceeds 500 $\mu\text{R/hr}$ but is less than 5000 $\mu\text{R/hr}$ at the surface of the vehicle, establish a restricted area around the vehicle with rope or "caution" tape at a 500 $\mu\text{R/hr}$ boundary. Post the vehicle with "Caution – Radioactive Material" signs and the perimeter of the boundary with "Caution – Radiation Area" signs.

6.5.1.3 If the exposure rate exceeds 5000 $\mu\text{R/hr}$ at the surface of the vehicle, it will be necessary to take additional precautions to prevent unnecessary personnel exposure. These will be determined at the time. Post the vehicle with "Caution – Radioactive Material" and "Caution – Radiation Area" signs.

6.5.1.4 The DOT E-11406 Shipment Approval Form (Attachment 3) requires the radioactive material identification and radioactivity concentration through MCA characterization and sampling. It is recognized that TENORM-containing material above the activity concentrations levels and above consignment activity limits listed in 49 CFR 173.436 are subject to US DOT Hazardous Material Regulations related to proper shipment name, manifesting as hazardous material, proper packaging, marking, and placarding as radioactive material. (For example, the exempt material activity concentration limits and exempt consignment activity limits for Ra-226, as TENORM, are 270 picocuries per gram and 0.27 picocuries,



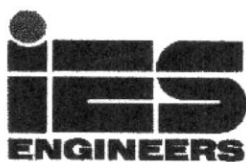
utilizing the same protocols as the waste delivery trucks. Alternatively, the ash in the "rolloff" container will be scanned using a handheld radiation monitor before being removed from the facility.

No vehicles are received in the absence of a scale operator. The radiation monitor controller is located at the dispatcher's desk, with a visible and audible alarm signal located so that it is visible and audible at the scale. Each time a vehicle passes through the monitoring system, the system prints out a report that also includes the radiation monitoring results. This will allow a representative of management to review the alarm history on a daily basis to assure that no radioactive waste has been received and not detected.

The most likely radioactive material to be contained in the waste received by this facility is short-lived medical radionuclides that are likely to be contained in trash bags. The other type of radioactive material that is likely to be received is low level naturally occurring radioactive material (NORM) containing potassium 40. It is the intent of DTE to consider the acceptance of potassium-bearing waste and requests a blanket approval from the Department. In the case of waste containing potassium 40, once the radionuclide is identified as potassium 40, the load will be dumped along with the non-radioactive waste. It is also possible for municipal waste to contain other naturally occurring radioactive materials, including uranium and thorium series radionuclides. Examples are: antique radium buttons and other radium-containing objects, "Fiestaware," rock collections, and Coleman lantern mantles, among others. Additionally there are number of consumer and industrial items containing radioactive materials (RAM) in general use that are assumed to be discarded in municipal waste. Some of these items include smoke detectors and self-luminous tritium EXIT signs.

While the portal truck radiation monitors play a significant role in the early detection and isolation of radioactive material within a load of municipal waste, an equally important role is played by DTE personnel in the visual identification of items that may contain radioactive material. Tritium-containing objects, such as signs, can only be detected visually. Incoming waste will be manually sorted and, therefore, the facility personnel will be trained to look for and remove these materials for proper low-level radioactive waste disposal. Items that may have been shielded from the portal monitors (such as smoke detectors or other consumer products) or that contain low energy tritium (such as self-luminous EXIT signs) will be identified and removed during the normal sorting process. Personnel will be trained in the importance of this process and the proper response to radioactive material identification during radiation training.

The potential for radiation exposure to workers and the public has been evaluated and found to be very limited. DTE prefers to outright reject most loads that cause an alarm and divert the vehicle to a nearby landfill. Past experience has shown that even during truck surveys, radiation exposure rates are typically well below 100 microrem (μrem) per hour and the surveys take only a few minutes to accomplish. Thus, the potential for significant external radiation dose is minimal and should be well below 2000 μrem (2 millirem) in an hour or 100,000 μrem (100 millirem) in a year. DTE will employ methods to identify all RAM prior to the truck leaving the tipping floor since the MSW will eventually be manually sorted by employees within the building. DTE will perform the initial external radiation surveys to determine if the source of radiation is from the driver or from the load, and if from the load, whether the radiation source constitutes a Level 1 or Level 2 condition. It is the intent of DTE to make use of either a contract health physics company to perform the



process measuring, control equipment, and combustion air fans. The outlet of the post-combustion chamber connects to the inlet for the boiler.

The PF is combusted in the Complete Combustion Chamber (CCC). The heat generated from this process is used to generate steam in the boiler.

Generation of Electricity

The flue gas from the CCC will be supplied to the water-tube boiler for the purpose of steam generation. The boiler will be sized to supply enough steam to power a turbine to generate 3 to 4 megawatts of electricity, and it will be insulated with mineral wool matting and covered with galvanized steel.

The water-steam circuit and associated systems, which consist of the steam system, steam turbo set, condensation and feed water system, and cooling system, will be used to generate power for the power supply network needs. The steam generation rates from the boiler to the turbine will be 36,300 lb/hr (16,465 kg/hr), and from the boiler to the RRS will be 8,530 lb/hr (3,870 kg/hr). The steam will also be used to drive the thermal process in the RSS system.

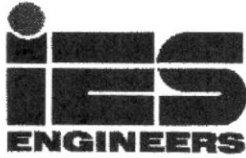
The superheated steam generated as a result of the combustion process will be used to power a turbine generator set that generates electricity. This process will generate a net positive quantity of energy. Excess electricity will be sold to the electrical grid and is a source of renewable energy.

Bottom Ash Residue

DTE's process will generate approximately 12 tons per day of bottom ash. The ash will be collected in a sealed roll-off dumpster container with an estimated capacity of approximately 40 cubic yards. Once full, the bottom ash roll-off container will be hauled offsite for proper disposal. The roll-off container is estimated to hold approximately 40 tons of bottom ash.

The bottom ash will be disposed of at approved facilities. DTE has a contract with Sustainable Waste Solutions (SWS) of Souderton, Pennsylvania, to haul and dispose of the bottom ash.

DTE will analyze the bottom ash and when it has sufficient analytical data to demonstrate that the material can be beneficially used, it will request the Department to modify the general permit to include the beneficial use of bottom ash.



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

RADIATION PROTECTION ACTION AND MONITORING PLAN

Prepared for:

DELTA THERMO ENERGY, A, LLC
ALLENTOWN, PENNSYLVANIA FACILITY

Prepared by:

IES ENGINEERS
BLUE BELL, PENNSYLVANIA

IES PROJECT NO. EV120894.03

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