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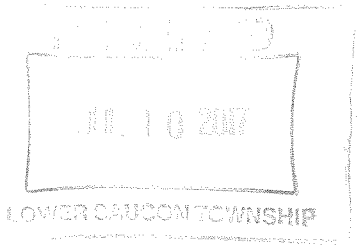
July 7, 2017



PaDEP
Attn: Mr. Roger Bellas
2 Public Square
Wilkes-Barre, PA 18711

RE: IESI-Bethlehem Landfill
Technical Review
Major Permit Modification
Southeastern Realignment
Application No. 10020-A151
Our file: b/1162.3/2017/RL53117

Dear Mr. Bellas,

In response to the Township's May 30 Phase II review letter and the Department's request that we provide you with a response thereto, we submit the following, with the Township comments in regular font and the responses in **bold** font.

Review Comments:

S
ROUTING
☑ Council
☑ Manager
☐ Asst. Mgr.
☑ Zoning
☐ Finance
☐ Police
☐ P. Works
☐ P/C
☐ P & R
☐ EAC
☑ Engineer
☑ Solicitor
☑ Planner
☑ Landfill
☐ EMC
☑ Other web

A. Cap Removal and Waste Relocation Plan and Procedures; Cell Development and Cap Installation Sequencing

1. In general, activities during this expansion operation will be expanded to numerous different activities that normally do not occur in regular ongoing operations. Regular operations have included daily acceptance and burial of the daily incoming waste, and drop off of recyclables by haulers and residents. Every few years, operations have also included new cell construction or capping of smaller areas in other areas of the site. These general activities normally occur in separate areas of the site: the daily working face with the new adjacent cell area being constructed, the area being capped, and the recycling drop-off area. These operations are normally independent of each other.

The proposed expansion operations will entail many different active operations occurring simultaneously, across the site during the 6- to 7-year

duration of the project through capping of the final cell. Most expansion and daily operations are dependent on the activities occurring in other areas of the site, including:

- MSE wall construction and site access road on the southeastern border;
- installation of stormwater management and erosion sedimentation controls in the southeastern expansion areas;
- existing cap removal activities over the central and eastern third of the site;
- transport of removed cap materials from the east to be re-buried in the western and central areas of the site;
- excavation of 315,000 cubic yards of refuse from the western most cell (Cell 4E) transported and re-buried in central and western areas of the site;
- new cell construction continuously during annual construction seasons;
- movement of soils (for liner construction, MSE wall and capping activities, daily and intermediate cover) to and from two independent soil stock pile areas in the southeast and central (high peak) portions of the site;
- delivery of off-site soils to the stockpile or construction areas;
- movement of liner and cap materials from delivery and staging areas to construction areas across the site;
- annual capping of completed Phase 3 and 4 areas and new expansion cells; and
- normal incoming trash daily operations and recycling drop-off and pick-up by recycling contractors.

The activities for the expansion will require storage areas and transport routes throughout the entire site from east to west and north to south. Areas that are final capped, with gas collection systems and which are not to be disturbed, should not be used for any traffic routes, stockpiling, or delivery/staging areas, and should be clearly identified as off limits in construction drawings and in the field. No construction staging or storage areas are shown on the permit plans. At the May 23, 2017 Public meeting, the Applicant indicated stockpiling on final capped areas would occur, which is prohibited by the approved Land Development Plans and by way of notes on the PA DEP application plans. Existing final capped areas with the intricate gas collection networks must be protected in order to continue to function properly during the entire expansion, closure and post-timeframes.

It is requested that the PA DEP impose a permit condition which clearly addresses protection of existing systems and requires those areas be shown on construction drawings and marked off-limits in the field.

BETHELEHEM LANDFILL RESPONSE: **There is no construction associated with the proposed Modification that is operationally different from construction which has been undertaken at the site in recent years.**

As to the comment regarding stockpile areas, please see Sheets LF-15 through 19 of the DEP Permit Application drawings, which show the stockpile areas atop the landfill mass. Per the recently approved Township Land Development Plans ("LDP"), this stockpiling is approved on "capped areas" – See, for example, Sheets 16 & 17 of 18 of the LDP Plans. A note on these plans states: "Portions of permanent cap will not be deemed "Final" until soil stockpiles are ultimately removed and the areas are evaluated for cap integrity". Similar wording is also included on the DEP sheets LF-15 through 19 stating: "Temporary Stockpile Note: No soil is to be stockpiled on top of capped areas prior to placing sacrificial geotextile or geomembrane atop the final cap cover".

2. It is requested that the PA DEP Waste Management and Air Quality Divisions incorporate inspection of all on-site areas of daily and construction operations into their regular monthly and quarterly inspections. Of interest and concern is that all proposed measures to prevent increased air emissions, dust, noise, traffic, and stormwater control construction, and capping schedule are being implemented as identified in the application documents. At the May 23, 2017 Public Meeting, PA DEP Waste Management Division confirmed this would be the case for their Department.

BETHLEHEM LANDFILL RESPONSE: **No response necessary.**

B. Updated NMCP (Nuisance Minimization and Control Plan)

No additional comments.

C. Slope Stability Analysis

1. Attachment 24-B Revised December 2015 and September 2016 - of waste mass of piggyback area, Pages 21 and 22 state:

"An additional measure that may be used to ensure that there are no metal objects within 7 feet of the piggyback liner system is to use geophysical methods to probe the near surface for potential void producing metal objects

in the upper ±10 feet of waste. If metal objects are found, they can be dealt with by:

1) physically removing them; or

2) placing additional compacted soil (or suitable waste) over the potential void producing metal objects such that the total soil thickness is at least 6 feet between the waste and the piggyback liner system in order to bridge the local strains due to the potential formation of a void in the waste."

The sequencing of construction, the construction and installation specifications, and the Quality Control Procedures in Liner System Form 24 and its Attachments do not include this requirement.

This requirement should be included in the permit application and construction specification documents, or an explanation given as to why it is not included.

BETHLEHEM LANDFILL RESPONSE: **John Gardner, P.E. of Smith Gardner, Inc., who prepared the subject analyses, responds as follows:**

The Hutchinson Group (THG) performed an electromagnetic survey of the piggyback area between March 11th and 13th 2014, with the report (dated March 17, 2014) presented as Exhibit 24-8.2 in the application package. The THG report identified two areas with potential metal objects. The comment from the Township notes that page 20 of Attachment 24-8 ("Settlement, Stability, and Piggyback Liner Evaluation") recommends either removing the objects or placing additional soil over them. These recommendations were based on the assumption that no reinforcement layer would be placed beneath the liner system. However, in the September 2016 revision of Attachment 24-8, Section 6.3.1 was added (beginning on page 18) to describe the calculation methods used to design the required strength of a geogrid if one were used to span void areas. The geogrid calculations are presented as Exhibit 24-8.8. The final design includes the recommended geogrid reinforcement layer over the entire piggyback area. Because the geogrid is now included in the construction plan for the Southeastern Realignment project, no excavation or additional soil is required to address the potential for metal objects, and these techniques are therefore not included in the construction specification documents.

D. Gas Collection and Control System

1. See Comments A1, A2, F5 and F6.

2. At the Public Meeting of May 23, 2017, Applicant confirmed that a second flare, if and when needed, would be installed at the location of the existing flare.

BETHLEHEM LANDFILL RESPONSE: **No response necessary.**

E. Liner System - Form 24 and Attachments and Related Plan Sheets

1. Attachment 24-2 - See Comment C.1 above.

2. Sheet LF-62 Access Road Details, show the liner, MSE wall and access road at the southern border of Cell SE-2A. The liner system shown does not include a secondary liner or leachate detection zone on these standard sections. *The Applicant should revise applicable engineering design sheets and confirm that the complete double liner system with leachate collection and detection zones, with geocomposite clay liner (GCL) as presented in Form 24-Liner System is used on all lined areas.*

BETHLEHEM LANDFILL RESPONSE: **LF-62 of the Application drawings, Access Road Details, shows the general sections of the Access Roadway as it progresses from West to East to North along the southeastern perimeter of the project. The Liner System Details are shown on LF-63 of the Application drawings, showing that there is a complete double liner system in all proposed new lined areas (piggyback and new landfill areas).**

F. Revised Landfill Closure Plan - Form 28, Attachment 28-1 and Bonding Forms

1. The Landfill Closure Plan (last paragraph of the introduction) appears to be specific to the closure of only this current expansion. *PA DEP should ensure the Landfill Closure Plan, as written, pertains to closure of the entire site including the expansion area, old sediment basins, and the stormwater conveyance and control systems. All quantity estimates and bonding amounts should be confirmed to also apply to closure of the total 201-acre permitted site.*

BETHLEHEM LANDFILL RESPONSE: **The Closure Plan narrative was updated and submitted in Volume 5 on April 20, 2017 to DEP and the Township (It was also previously provided to the Township during the**

LDP process). It does include closure and bonding of the entire 201 acre permitted site.

2. The Landfill Closure Plan Attachment 28-1 does not contain any "Post Closure Land Use Plan" or discussion as required by Section B of Form 28. *This information should be provided as part of the application.*

BETHLEHEM LANDFILL RESPONSE: **The site will be maintained as open space following closure.**

3. Bonding Form Page 7 requires identification of on-site soil borrow areas. The Applicant identifies that all soils except topsoil will be obtained on site. The accompanying Worksheet J identifies an on-site soil borrow area of 20 acres to be graded and closed at closure. The plans show two stockpile areas, but not a soil borrow area. The 20-acre area within the permit boundary where the soils for construction will be obtained is not shown on any plan sheets. Earlier permit application documents (Form F - Soils Information) identified that off-site soils would be brought in for construction and cover materials. *Clarification of this conflicting information is requested, and the proposed borrow area should be identified.*

BETHLEHEM LANDFILL RESPONSE: **There is no 20-acre soil borrow area. Worksheet J is included in the bonding calculations to cover the regrading and revegetating cost of any disturbed perimeter areas, estimated as a total of about 20-acres across the site.**

4. Closure of the site also includes removal and relocation of 315,000 cubic yards of existing refuse from the far west side, Cell 4E. The capping sequence shows a temporary cap on Cell 4E, on the "existing" site through every phase of the expansion (Plan sheets LF-26, LF-27, LF-28). Final capping of Cell 4E is then scheduled in the closure year. Refuse relocation, temporary cap removal and final closure and capping of Cell 4E is not discussed in the closure plan, nor included in the bonding costs to move the refuse. There is also no discussion of this separate and significant operation in the Cap Removal and Waste Relocation Plan and Procedures. It is unclear how, when and where this refuse will be relocated since the plans call for the area to be temporarily, then permanently capped as soon as the permit is issued. *Information on the sequencing of this significant operation for Cell 4E should be provided as part of the application.*

BETHLEHEM LANDFILL RESPONSE: **The sequencing of areas where active filling, capping and construction phases is to take place is as shown on the Cell Development/Closure Plan sheets LF-26, 27 & 28, revised and submitted to PADEP and LST on April 20, 2017 (These are in conformance with those included in the approved Township LDP). The**

315,000 cubic yards of existing trash to be relocated is already accounted for in the net volume available for the Southeastern Realignment, is a part of the construction of the cells of the project and, therefore, is not a part of the bonding calculations.

5. Landfill Gas Control and Monitoring System, Section 2.4, does not address the closure of the Exelon gas to energy plant. There is concern for how and when this is to be accomplished and who is responsible for taking the plant off line, removing or repurposing buildings and equipment, piping, tanks and securing the site when gas production from the facility ceases being processed by the plant. The gas to energy plant is an integral component of the landfill gas collection and control system. *The responsible party and the responsible closure/permitting agency should be identified and the approved closure plan for this portion of the gas collection and control system should be provided or referenced as part of the application.*

   BETHLEHEM LANDFILL RESPONSE: **The gas to energy plant is a separately permitted and owned entity and, as such, is not included in the landfill's closure plan.**

6. Landfill Gas System Bonding Calculations Worksheet G, Item 19 requires the system to be operated and/or maintained for the 31 years, post closure period. The Applicant has used only 21 years which also reduces the required bond amount. *The reduced timeframe and bond amounts should be corrected or explained.*

   BETHLEHEM LANDFILL RESPONSE: **Consistent with the analysis approved in the Phase IV Bonding Calculations, the degeneration of landfill gas production following site closure is such that 21 years after closure, landfill gas management is no longer required. Therefore, a period of 21 years was used in the Worksheet G calculation submitted with the pending application. We note that NSPS allows for the cessation of operation of the GCCS 15 years after closure (40 CFR 60.752). Thus the 21 years provides for an additional 40% operational time beyond the requirement of NSPS.**

   That said, we have recalculated the bonding (Worksheets G & L - attached) to reflect the 31 years of post-closure landfill gas management.

7. Closure Plan comments issued during the Phase 1 review requested a schedule of inspections and maintenance activities during the 30-year post closure period. This has not been included in the revised Landfill Closure Plan as required by Form 28, Section C, Item 5 a through g. The lack of identified inspections and maintenance to ensure proper performance of all systems post-closure is a major concern. Current wording only states that

periodic inspections will be conducted. *An inspection and maintenance schedule for all post closure activities should be included in the Closure Plan.*

BETHLEHEM LANDFILL RESPONSE: **The Nuisance Minimization and Control Plan, submitted in the April 20, 2017 Volume 5 binder, (and provided to the Township as a part of the LDP process) contains the requisite inspection/maintenance activities during both site operation and the post closure period.**

G. General Plan Comments

1. *Key dimensions should be provided on the site plans and sections to show that the applicant will be meeting the setback requirements approved during the Township Land Development Plan approval process. The Covenant "No Waste Area" should be shown with survey dimensions. A few key dimensions should be provided to identify the location and extent of the MSE wall relative to the property lines.*

   BETHLEHEM LANDFILL RESPONSE: **The 'covenant - no waste area' is shown on LF-8 of the DEP drawings. This restricted area is also shown in detail on the Township's LDP drawings 9, 11, & 12, and no further definition of said area is warranted.**

   The MSE wall is also precisely shown on several of the DEP drawings (e.g. LF-7, 8,15, 16, and MSE 3).

2. *The plans showing the western property line should also show the location and dimensions of the LSA water pipe and access easement, the stormwater system, the landfill access road, and any landscaping (buffer screening) required by the existing (old) Land Development Plan approvals.*

   BETHLEHEM LANDFILL RESPONSE: **The approved Township Land Development Plans show applicable easements in great detail. The LSA waterline and water tank are shown on LF-1 of the DEP drawings. The Township approved LDP drawings show all of the screening/buffers/etc. as are required per Township approval.**

3. *The plans should label and show the location of the sediment basins along the northern border that were installed by prior landfill owners.*

   BETHLEHEM LANDFILL RESPONSE: **The sediment basins along the northern border are shown on sheets ES-1, ES-3 & ES-5 of the DEP plans.**

4. *The plans submitted to the PA DEP should list the plan set sheets conditionally approved by the Township as part of the construction set so that the owner and contractors have all the information shown on both sets.*

BETHLEHEM LANDFILL RESPONSE: **DEP has been provided with a copy of the LST conditionally approved Land Development Plans. Pertinent details from these will be included in construction drawings when those portions of the project are constructed.**

In the event any questions arise concerning this correspondence please feel free to contact this office at your convenience.

Very truly yours,
MARTIN AND MARTIN, INCORPORATED

Richard M. Bodner, P.E.

Enclosures
cc: IESI Bethlehem
LAW
Lower Saucon Township
Northampton County

Date Prepared
10/14
Rev. 7/17

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

I.D. Number
100020

BONDING WORKSHEET G
GAS COLLECTION SYSTEM

1. Number of wells in the approved monitoring plan. 150
   a. Shallowest well depth 30 ft.
   b. Deepest well depth 120 ft.
   c. Average well depth 75 ft.
   d. Number of wells installed 69
   e. Number of pumping wells 69
2. Cost for flare or other control device installation $ 0 (already installed) LS
3. Unit cost to install a well (including, drilling, installation, and connection to active system) $10,875 $/well
4. Unit cost to install a gas well requiring liquid removal (including, drilling, installation, and connection to active system) N/A $/well
5. Number of wells to be installed (wells in the approved plan that haven't been installed) 30
6. Number of gas wells requiring liquid removal to be installed 0
7. Estimate the length of collection piping to be installed 10,000 LF
8. Unit cost to install collection piping (include excavation, pipe bedding, pipe, backfilling, regrading, revegetating, surveying and QA/QC) $26.50 $/LF
9. Number of wells to be replaced/repaired over the life of the monitoring period (use 10% of line 1 and round up) 15
10. Unit cost to monitor well and balance system monthly (include monitoring of methane, oxygen, carbon dioxide or nitrogen, temperature, pressure, and NSPS record keeping) $24 $/well
11. Unit cost to conduct surface monitoring (NSPS) $3,400 $/event
12. Control System Information Existing
    a. number and size of blowers 2-50HP estimate
    b. flare dimensions and capacity 50' x 11' (4,000cfm)
    c. current flow rate 2,500
    d. other features None (PPL utilities gas for elect generation)
13. Cost of electricity to run system $25,000 $/year
14. Cost to maintain system (including daily check, weekly charts, maintenance, etc.) $17,500 $/year
15. Cost of annual blower maintenance (including greasing, bearing check and alignment) $5,000 $/year

16. Cost of stack testing (once per five years) $13,000 $/event
17. Estimate the volume of condensate generated per year N/A gallons
18. Cost of condensate management (including pumping, testing and treatment/disposal) N/A $/year
19. Number of years to run system (30 + time to close) 31 years
20. Cost Summary –Gas Collection System See below

System Installation

a.	Additional well installation (line 5 x line 3)	$ 326,250
b.	Additional pumping well installation (line 4 x line 6)	$ 0
c.	Cost of collection piping (line 7 x line 8)	$ 265,000
d.	Well replacement (line 3 x line 9)	$ 163,125
e.	Enclosed ground flare system (line 2)	$ 0
	System Installation Subtotal (sum lines a to e)	$ 754,375
f.	Cost of monitoring/balancing (line 1 x "12" x line 10 x line 19)	$ 1,339,200
g.	Cost of surface monitoring (line 11 x "1.5" x line 19)	$ 159,100
h.	Electric Cost (line 13 x line 19)	$ 775,000
i.	System maintenance cost (line 14 x line 19)	$ 542,500
j.	Blower maintenance cost (line 15 x line 19)	$ 155,000
k.	Stack testing cost (line 16 x [line 19/5])	$ 80,600
l.	Condensate management cost (line 18 x line 19)	$ N/A
	System Monitoring and Maintenance Subtotal (sum lines f to l)	$ **3,050,400**

Adjustment for miscellaneous maintenance items (including; knockout pot maintenance, thermocouple replacement, flame detector replacement, flame arrester maintenance, flare maintenance, enrichment/startup gas replacement, pneumatic valve maintenance, sump maintenance, panel board maintenance, etc.)

a. Use 0% of subtotal if system[1] < 2yrs old
b. Use 5% of subtotal if system[1] is > 2 yrs old, but < 5yrs old
c. Use 10% if system[1] is > 5 yrs old

$xc= 152,500

Total (Installation subtotal + M & M subtotal + Misc. Maintenance) $ **3,957,275**

(Place this total on Summary Cost Worksheet – line 7)

[1] *The age of the system would be considered from the date that the active system went on-line. Expansions of the systems are assumed to occur, however, this does not change the age of the system unless a majority of the existing system is replaced/upgraded.*

Date Prepared
10/14
Rev.3/17 & 7/17

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

I.D. Number
100020

BONDING WORKSHEET L
SUMMARY COST WORKSHEET

Cost Summary - Landfills

1.	Decontaminating the Facility	$ 2,827
2.	Capping/Closure	$ 1,674,347
3.	Groundwater Monitoring System	$ 1,624,115
4.	Surface Water Monitoring	$ 184,481
5.	Private Water Supply Monitoring	$ 435,240
6.	Gas Monitoring	$ 114,850
7.	Gas Collection and Maintenance	$ 3,957,275
8.	Other Monitoring	$ 43,400
9.	Leachate Management	$ 1,394,442
10.	Borrow Area Closure	$ 182,473
11.	Maintenance Costs	$ 1,092,489
12.	Other Costs[1] _____	$ N/A
13.	Other Costs[1] _____	$ N/A
	Subtotal	**$ 10,705,499**

Inflation

14.	Inflation rate (projected inflation for the next three years based on the inflation for the prior three years).	5.73 %
15.	Inflation cost for facility (subtotal x line 14)	$ 613,447

Contingency and administrative fees

16.	Administrative fees (5%) (subtotal x 0.05)	$ 537,295
17.	Project Management (5%) (subtotal x 0.05)	$ 535,295
18.	Contingency fee amount (subtotal x rate of contingency fee from Table 1)	$ 1,070,590

Total (subtotal + line 15 + line 16 + line 17 + 18) **$ 13,460,526**

[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.