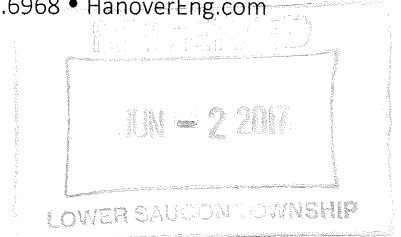


Hanover Engineering

252 Brodhead Road • Suite 100 • Bethlehem, PA 18017-8944
Phone: 610.691.5644 • Fax: 610.691.6968 • HanoverEng.com

May 31, 2017



Ms. Leslie Huhn, Township Manager
Lower Saucon Township
3700 Old Philadelphia Pike
Bethlehem, PA 18015-5426

RE: IESI-Bethlehem Landfill
Technical Review
Major Permit Modification- Southeastern
Realignment/Expansion
Application No. 10020-A151
Hanover Project LS15-19

Dear Leslie,

The Landfill Technical Consultant Committee received and reviewed the IESI Technical Submission to the PA DEP for the above-referenced Major Permit Modification as received by the Township on or about April 21, 2017. This letter provides the review comments from that Committee.

Introduction:

This Major Permit Modification Expansion Application applies to approximately 57.5 acres of the permitted 201 acres of the site. The project includes 29 acres of additional overtopping waste in the central and western portions of the site (over completed Phases 3 and 4), 22.5 acres of additional waste with a new liner system overtopping previously capped areas (piggyback waste), and 6 acres of new expanded landfill area.

These technical review comments are based on the review of the documents listed below. Also considered are responses by PA DEP and IESI during a Public Meeting held on May 23, 2017.

The Lower Saucon Township technical consultants have reviewed the listed documents and focused their comments on areas of the proposed expansion that cause concern for creating potential environmental harms due to the technical design and construction approach, items which need clarification in order to be consistent with existing Township approvals, or items which do not appear to meet the PA DEP application or design requirements, (such as missing or conflicting information). The Township technical consultants do not do field testing, verify engineering assumptions or do mathematic or detailed checks of the designs.

We recommend that Lower Saucon Township request PA DEP consider these comments in their technical review of the application, and where requested, that the Applicant respond to these comments. Information may exist in the application which addresses these comments, but due to the volume of materials, may have been missed or misinterpreted. The review comments and recommendations below are provided, to a reasonable degree of engineering certainty, based on

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

engineering experience with landfill design, operations, construction and the regulations which govern these activities, but the engineering design is the responsibility of the Applicant's professionals that prepared the documents.

Documents Reviewed:

1. 1/21/15 – Southeastern Realignment expansion application-technical design, construction specifications, and associated engineering drawings including:

- Form 24 - Liner System
- Form 25 - Leachate Management
- Form K - Gas Management
- Form F - Soils Information

2. 4/20/17 – Volume 1 revisions, revised Volume 3 and revised design plans as follows:

- Revised Drawing I-1 showing the relocated MSE berm and Access Road
- Updated Cap Removal & Waste Relocation Plan and Procedures
- Updated Nuisance Minimization and Control Plan
- Revised Slope Stability Design per the relocated MSE berm and access road
- Revised MSE berm design and stability analysis per the relocated MSE berm and access road
- Revised Form 28, Closure Plan, and Bonding Calculations
- Revised Form I reflecting the relocated MSE berm and access road; and
- Updated Engineering Design Plans reflecting the MSE berm and access road changes

3. The following interim responses and supplemental information received by the PA DEP and the Applicant between the 1/21/15 submission and the revised submission of 4/20/17 are as follows:

- 10/16/15 – 1st EA review letter
- 12/31/15 – Response to EA review letter (Volume 4)
- 01/29/16 – Supplemental information received – FAA and Hydro-geological data
- 09/27/16 – 2nd EA review letter
- 12/20/16 – 2nd EA review response received
- 01/23/17 – IESI's response to Township comments received
- 04/17/17 – EA approval issued

Review Comments:

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.

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.

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.

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.

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.*

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.*
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.*
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.*
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.*

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.*
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.*
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.*

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

Ms. Leslie Huhn
Township Manager

7

May 31, 2017

Please let me know if you have any questions on these comments, or the application itself.

Respectfully,

HANOVER ENGINEERING

A handwritten signature in black ink that reads "James B. Birdsall". The signature is written in a cursive style with a large initial "J" and a long horizontal stroke at the end.

James B. Birdsall, PE
For the Township Engineer

jbb:llb

S:\Projects\Municipal\LSauconTwp\LS15-19-IESI-MajorPermitModification-SoutheasternRealignment\Docs\2017-05-31_Huhn-TechnicalReviewLtr.doc